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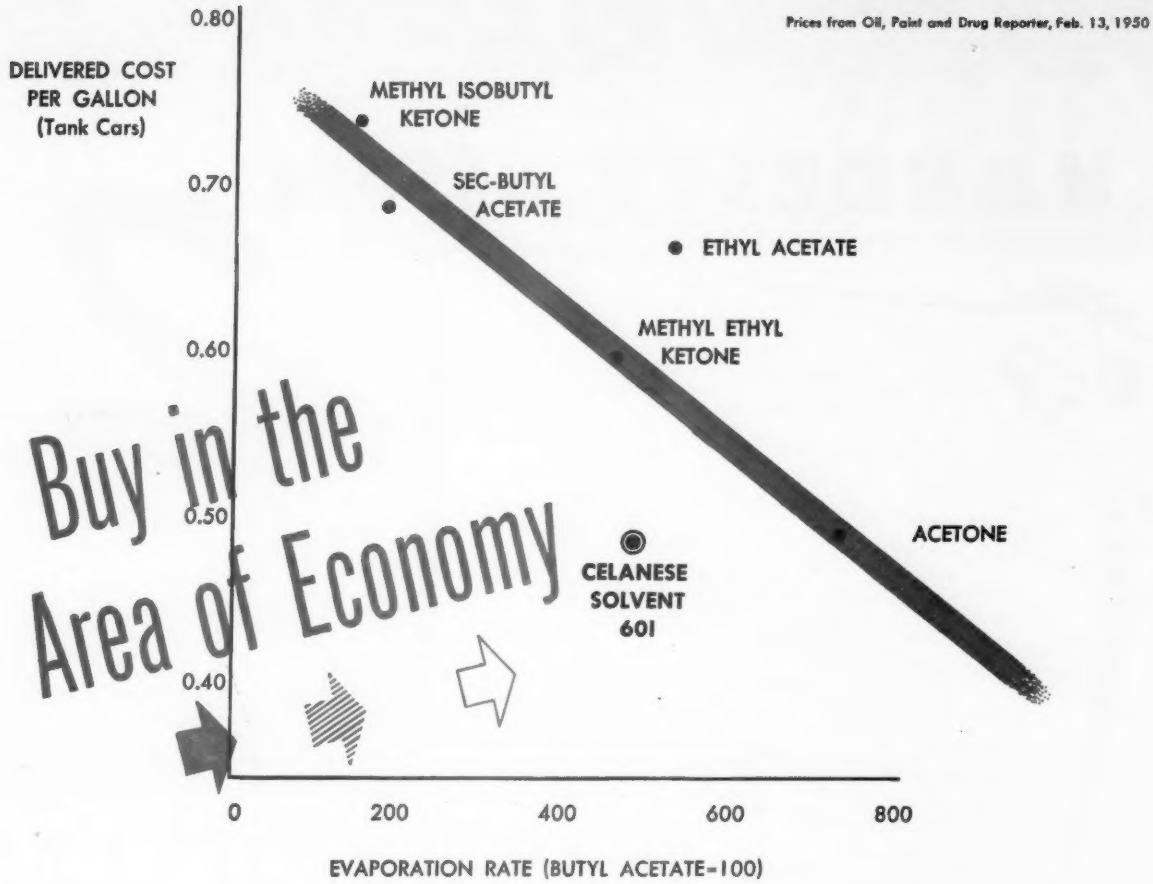
THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

MARCH
1950



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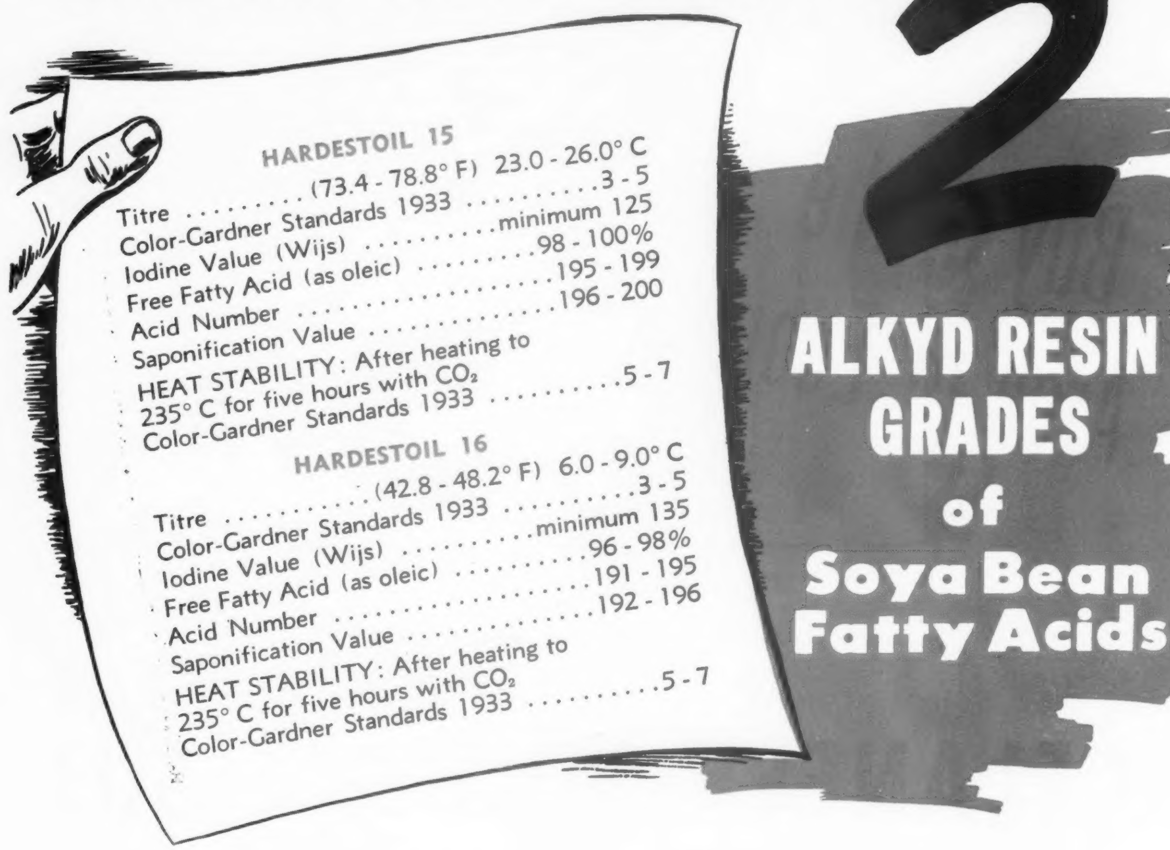

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VOL. XXX No. 3

FEATURES

DEPARTMENTS

NEXT ISSUE

Our April issue will carry a very interesting report on a study of underwater paints for constructional steel. Corrosion problems due to sea water are discussed together with methods and results of tests. Coatings tested include bituminous, tar-pitch, red lead primers, benzylcellulose lacquers, chlorinated rubber, and hot-applications containing various inorganic fillers.

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Editorial Comment

Yours for the Asking

As a paint manufacturer, are you taking full advantage of the practical help and guidance offered by your raw material suppliers through their technical service personnel?

Here is an invaluable source of aid for the paint manufacturer, one which is often times overlooked in the rush of pressing business and problems. Your relationship with the raw material supplier is important, for he is in a position to render a service which will be an asset to your organization. In this connection, assistance and cooperation on your part can go a long way toward arriving at a quick solution of the problem at hand.

Many paint manufacturers are sometimes reluctant to give the full story of a particular problem to their raw material representative for fear that they may reveal a secret formula or "know how." This attitude makes it difficult, and at times impossible for the supplier to help you.

Consider technical service representatives as members of your own technical staff. Work with them closely. Take them into your confidence. Regular consultation with these men is like adding another skilled specialist to your staff, *but without cost to you.*

Most of these men represent large, established organizations which maintain well-equipped laboratories staffed with highly technical personnel. Also, by virtue of their specialized "know how" and everyday experience with paint manufacturing techniques, they are in a better position to provide accurate and quick answers on any of the problems you may have regarding coating technology. You will find that the technical service man is a seasoned "trouble-shooter" and his specialized knowledge and experience is at your command.

Of equal importance, you will find that the suppliers will keep you fully informed on all latest developments. Even when production seems to be going smoothly, talks with these men at frequent intervals are worthwhile in that some suggestion may mean improvements and economies in your products.

Your raw material supplier is, and always will be willing to help you, if you will but give him the opportunity to provide you with timely and constructive service which is yours for the asking.

RUBBER BASE PAINTS

All photos courtesy of United States Rubber Co.

by H. L. Rice, Chief Chemist
Rubber & Plastics Compounds, Inc.

Rubber compounds have been successfully used as film-formers and during the last few years have created quite an interest among paint chemists as basic ingredients in the formulation of water-emulsion paints. So readers fully understand this important raw material, Part I of this article is devoted to the properties of rubber substances, particularly latex. Handling and methods of concentration and preservation are also covered.

THERE are two types of synthetic rubber paints:—

(1) The rubber solution type, in which the synthetic rubber is incorporated in a vehicle of treated drying oils, aromatic hydrocarbons, and coal tar thinners and pigmented with opaque, weather-resistant pigments, and

(2) The rubber emulsion type, in which the synthetic rubber resin is treated with an emulsifying agent, so that the paste paints are reducible with water. These emulsion paints are in the development stage, but have sufficient package stability for "over-the-counter" sales.

The rubber-solution paints are available at most paint stores and usually sell for slightly more than oil-base masonary paints. They may be applied by brush or spray gun to dry or slightly damp walls. They appear to be particularly suitable for painting asbestos-cement siding and shingles. These paints are also useful for "sealing in" stains on old masonry, and as protective primers under finishing coats of resin-emulsion or oil-base paints.

Latex

THE commercial use of latex was hampered for many years because methods of preserving and shipping this material in a liquid state were not fully understood. It was not until the early part of 1920 that successful methods of collecting, preserving natural rubber latex were developed at the rubber plantations in Malaya and Sumatra. Since that time much research has been done on the use of natural rubber latex, which has resulted in a wider use of this material for many types of finished rubber products.

The term "latex" may be applied to all naturally occurring milk-like fluids of vegetable origin but its use technically is becoming more and more restricted to those which contain rubber or rubber-like hydrocarbons. There are well over 200 different types of trees known to contain rubber or related hydrocarbons in their latices. However, only a few of them are of commercial importance, the only one requiring any mention here being Hevea brasiliensis.

Practically all commercial rubber latex is derived from Hevea brasiliensis cultivated in the Middle East. As is well known, latex is obtained by tapping the tree trunks, bulking the individual yields, and when destined for overseas shipment is treated the latex with ammonia to preserve it and prevent coagulation in transit and subsequent storage.

Rubber Particles

AS is well known, latex consists of a more or less concentrated suspension of dispersed rubber in an aqueous medium. The rubber particles vary considerably in size and shape. The majority, however, are elongated and somewhat pear shaped. The size of the globules of rubber are believed to be from 0.5 to 3 microns in diameter and 4 to 6 microns in length. It has been estimated that the number of dispersed particles in normal latex may reach 200 million per cubic centimeter.

The rubber particle consists, according to Hauser, of three distinct parts—an outer layer or film of adsorbed substances, presumably containing protein substances, then a nearly solid elastic shell surrounding a viscous but rubber-like interior. The latter two constituents compose the actual rubber particles.

The particles of the rubber in latex carry a negative electric charge. The same is true for ammonia-preserved latex. If an electric current is passed through latex, the rubber

particles migrate towards the anode or positive electrode, where they become discharged and flocculate, forming a concentrated deposit. This is the basis of the Anode process of forming rubber articles from latex.

Types of Concentrate

NORMAL latex has a very low viscosity. Its rubber content is relatively stable to agitation and compounding materials, after it has been bulked, preserved with ammonia at the plantations. However, because of its low viscosity, compounding ingredients added to it may settle out too readily, which is the main difficulty in using this type of latex. The dry film, even when vulcanized is not immune to water absorption, because it contains approximately 9% of water solubles in the form of proteins, sugars and resins.

The centrifuged concentrate such as B Revertex, is prepared by passing normal latex through a modified cream separator. The skim contains 6–20% solids while the concentrate contains 60–68% solids, depending upon the operation of the centrifuge. By this method not only is the concentration of rubber content increased but also a large portion of water solubles are removed from the serum fraction. Biffen in 1898 first discovered how to concentrate rubber latex by this method. Because of lack of interest this method was forgotten until rediscovered by Utermark in 1923.

The creamed concentrate is prepared by adding such organic colloids as Gum Karaya, Gum Tragacanth, locust bean gum, alkali aliginates, pectins, etc. to the latex. These added colloids are absorbed on the surface of the latex particles, thereby slow up the Brownian movement. Due to their lower specific gravity, these particles rise to the surface. The serum fraction is drawn off and, since it contains practically no rubber, it is completely discarded. This method of latex concentration is less expensive that the centrifuging method. Latex produced in this manner has a higher viscosity and contains a greater water soluble content that the centrifuged concentrate. Although these concentrates are relatively unstable and require care in compounding, their viscosity is sufficiently high to keep compounding ingredients in suspension.

The evaporated Latex (Revertex) is a 72–75% prepared by adding approximately 0.25–0.50% caustic soda or potash as a preservative and stabilizer to Normal Latex and evaporating a large portion of the water content. It becomes a thick paste which loses its viscosity very rapidly on the addition of water, and because of its high soap content, it will foam. At least it is by far the most stable and penetrating latex. Its dry film is indeed very soft, hygroscopic and greasy. B Revertex is a 60–63% centrifuged concentrate and should not be confused with the evaporated concentrate which contains 72–75% total solids content. Thus far of all the types of latices discussed, none are considered as very suitable for the formulation of water thinned, rubber based paints from the natural latices.

There is however, a type known as Vultex, or vulcanized latex, in which the rubber particles have been vulcanized in suspension, and which upon drying produces a cured texture without further application of heat. This type of latex has practically no tendency to thicken during storage and can be obtained with a solid content up to 65% and viscosities up to a heavy paste or dough.

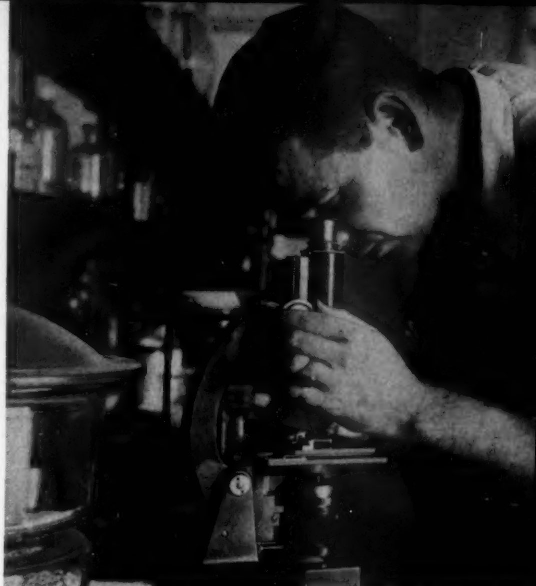
Properties

THE use of latex is today firmly established in the rubber, paper and leather fields because of its relative low cost, ease in handling and the elimination of the fire hazard, accompanying the use of naphtha solvents. Moreover it is possible to get better adhesion to wet surfaces with a water thinned rubber base paint, than it is to be obtained with those contained in a naphtha solvent type of rubber paint.

There are two distinct types of latex, normal latex and concentrated latex. The latter is divided into centrifuged, creamed, and evaporated cencentrated latices. The approximate analysis and physical properties of these latices are given in Table I.

Choice of Latex

PROSPECTIVE manufacturer of water thinned rubber paints must know the proper type of latex to use. This will involve the type of processing equipment on hand in his plant, the proper type of storage



Research is being carried on constantly at the U. S. Rubber Company's plantation in Malaya.

Above: Technician experimenting with rubber latex. Below: Improving methods of growing, concentrating and shipping are carried on here.

TABLE I

	NORMAL	CONCENTRATED	EVAPORATED
Total Solids	35–42%	58–68%	72–75%
Dry Rubber Content	31.8–38.2%	56–67%	65–68%
Ammonia	0.5–1.0%	0.5–0.75%	None
NaOH or KoH	None	None	1+%
Water Solubles	3.0–4.0%	1.5–2.0%	6+%
Ash on Total Solids	0.9–1.2%	0.2–0.4%	3+%
Nitrogen on Total Solids	0.6–0.7%	0.2–0.3%	1.1 – 1.4%
Viscosity-Centipoises	4–5	30–60	High
Specific Gravity	0.973–0.978	0.94–0.95	——
Weight/U.S. Gallon	8.10–8.15 lbs.	7.92–7.93 lbs.	——
Solid/U.S. Gallon	2.87–3.4 lbs.	4.6–5.38 lbs.	——

equipment to hold the uncompounded latex, and milling machinery or colloidal equipment that he has available, to bring about a complete finished product of water thinned rubber-based paint.

Normal latex, containing 35 to 42% total solids, is that which is collected directly from the rubber tree, bulked and preserved with ammonia on the rubber plantations. It has a low viscosity and the quantity of rubber contained in it is relatively stable against agitation.

The specific gravity of latex varies with the rubber content and the latter varies with the age of the trees, tapping conditions, weather and other factors. It is far from being a constant quality. However, under well supervised plantation conditions, latex as collected for shipment to this country usually has a specific gravity of 0.980. This corresponds approximately to a dry rubber content of 35 to 40 percent. One gallon (American) of such latex will weigh about 8.14 lbs. and contain from 2.91 to 3.32 lbs. of dry rubber. Table II gives the approximate relationship (calculated values) between specific gravity and rubber concentration.

Normal latex has a surface tension of about 40.5 dynes per centimeter. Dilution diminishes the surface tension until a minimum value of 30.5 dynes is reached at a rubber concentration of 0.55 percent. Further dilution then causes the surface tension to increase and finally approach that of water, which is 71 to 72 dynes per centimeter at 30° C.

Determination of the pH value of latex offers difficulties on account of the sensitive colloid nature of the latex. Various figures have been published, such as 5.8–6.3 (Belgrave) and 6.2–7.0 (Bobiloff) depending on the method used. Hauser has found the value 7.0–7.2 for freshly tapped latex, using Wulff indicator paper. When this drops to 6.9–6.7 after standing a few hours, the latex coagulates.

For rapid but rough determinations of pH values in latex work B.D.H. Universal indicator (British Drug Houses) may be used. This works over a range of pH 4 to pH 11. Ammonia-preserved latex containing 0.45 percent of anhydrous ammonia has a pH value of around 11. The pH value varies with ammonia content.

Since the rubber content as well as that of other constituents of fresh latex is subject to considerable variation, it is impossible to give definite, standard figures covering the composition. The following figures may, however, be regarded as approximately representative of average normal latex as collected.

Rubber	37.13–41.29%
Resins	2.03– 3.44%
Albuminoids	2.18– 2.80%
Sugars	0.36– 4.17%
Mineral matter	0.40%
Water	52.30–55.10%

The ordinary latex entering the U. S. at the present time is preserved by the addition of at least 0.5% of its weight of dry ammonia, which is passed into the latex as ammonia gas from cylinders. The presence of this ammonia must always be dealt with in latex work. The ammonia content diminishes slowly, for instance, a latex containing 0.65% on the estate may show only 0.55% of ammonia when it reaches the U. S.

In commercial practice the total solids content of latex is usually determined rather than the dry rubber content. Total solids may be determined by running 10 grams of latex from a pipette into a tared, shallow, glass dish and allowing the latex to dry over-night in an oven at 60°–70° C. The deposited film should be turned over to complete the drying. It is then weighed.

To determine the dry rubber content, a weighed quantity of latex, about 25 c.c., should be completely coagulated by pouring 175 c.c. of

(*Turn to Page 15*)

Centrifuges are used to concentrate latex. Thick latex comes out of spout farthest left; watery serum from spout below.

Latex is stirred in coagulation tank. Just before latex coagulates, metal slides are stood in tank so that rubber will coagulate in slices.

graphite as a black pigment

by

George Reich

PART II

IN discussing the modern graphite paints we must distinguish between the stove paints mentioned in Part I, Feb. 1950 issue, and the following three types of paints used for cold and moderately warm iron and steel surfaces:

1) Paints for iron and steel structures resistant to atmospheric influences.

2) Machine paints resistant to moisture, oils, soap water and other lubricating and cooling agents.

3) Acid-resistant paints in chemical works, for general chemical apparatus, in laboratories, etc.

In discussing the *structural paints* we must again distinguish between the type of structures painted, gloss effects desired, type of application (brushing or spraying) and, most important of all, the kind and intensity of atmospheric influence encountered. It is obvious that steel structures in dry and hot climates require different types of paints than cool and wet climates while maritime atmospheres usually are most severe. All these considerations do not concern the graphite as pigment, which if of good quality will stand up under any atmospheric, thermal or chemical action whatever; they do apply exclusively to the type of vehicle, resins, solvents, oils or oil substitutes employed.

Anti-rusting paint films exhibiting absolute resistance to severe atmospheric conditions or maritime climates must be composed of three different layers of course, while for ordinary conditions such as surfaces protected against rain or sleet two well applied films may suffice. The priming coat should always contain an active pigment such as red lead and red oxide of iron. As a rule, both are present together their ratio of combination varying between 8:2 and 6:4. Vehicles usually are synthetic resins (such as alkyd resin, linseed oil, etc.). Iron mica and finely ground graphite also are frequently used, sometimes together, sometimes the graphite alone. It must be understood, however, that these pigments are not of the active kind.

The first part of this article appeared in the Feb. 1950 issue and dealt chiefly with the physical and chemical properties of graphite and its use as a pigment in stove paints. Part II concludes this series and is concerned with the formulation of anti-rusting paints, machine enamels, and acid-resistant coatings.

Advantage of Graphite

THERE is one considerable advantage graphite holds over aluminium flake powder. It does not react in any way with oils of high acid number, forming hydrogen and thus inducing the formation of foamy sections within the film. It is quite true, of course, that pure metallic aluminum powders do not react with oils of high acid number or with free fatty acids any more than graphite, but aluminum oxide is able to do so, and since aluminum surfaces exposed to the atmosphere for only a short time are bound to develop an oxide film (if only of microscopic thinness) this danger prevails unless the aluminum powder is always kept in airtight containers and poured directly into the vehicle on mixing.

There can be no doubt, however, and this has been proven by the investigations of Dr. H. Wolff, Dr. G. Zeidler, and Dr. Wagner that perfect results are obtainable if the aluminum paints contain a suitable amount of inactive scaly pigments such as iron mica, and graphite. Asbestine may also be used for the same purpose, although it is of a fibrous structure rather than scaly.

Similar conditions from a practical point of view apply for the so-called "plated pigment paints" in which an active anti-rusting pigment such as red lead is combined with scaly pigments. Chemical methods of production do not apply to graphite since these are possible only with aluminum flake powder, non-metallic pigments like graphite being unable to produce the reactions in question. However, the colloid-chemical, structural-chemical and electrochemical processes are available, best results being doubtlessly obtained with the electrochemical process of combination. It is also the most economical by far.

Ratio of Pigments

AS to the ratio of the mixtures of active and inactive pigments all depends on the type of active pigment employed. In the case of red lead, 50% of graphite additions would usually be considered the maximum where severe atmospheric conditions or maritime climates are concerned. Where corrosive conditions are not so extreme, however, graphite additions of up to 80 percent. will yield satisfactory results. This applies to graphite as well as to iron mica or even to non-scaly pigments, although the protective capacity of the latter (if inert like graphite) is not nearly as pronounced as that of the scaly materials.

It is one of the considerable advantages of the non-active pigments

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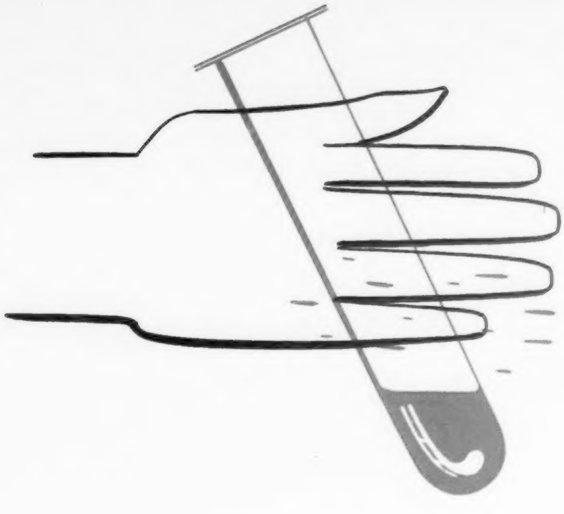

Chemical Analysis o

ORGANIC paint-, varnish- and lacquer films applied for anti-corrosion purposes on surfaces of organic or inorganic materials are rarely subjected to chemical analysis such as are common for other substances as, for instance, metallic alloys—i.e. by dividing them up into their constituents. This fact is the more peculiar since the unceasing advances of synthetic resin chemistry have for years enabled organic films to take the place of protective metallic layers, or coatings, such as chromium or nickel plating, etc.

The modern varnish or lacquer producer is able to-day to make use of many raw materials from which to develop his products and to meet the specifications which have gradually been developed by the various institutions (railways, army and navy technical societies, etc.).

In one of his poetical creations, Theodore Fontane once said (in 1890) that "a real varnish must not be sticky for a long time. It should dry at once so that a next day's fog or rain could not harm it." This may really be considered the first varnish specification, and an almost straight line of development leads from it to the many technical specifications governing the supply of paint and varnish materials to-day.

The chemical testing of paints and varnishes has not nearly attained as high a standing as the specifications developed for these materials. It is quite certain, of course, that no chemical-analytical advance will ever place us in a position to identify, say, any of the 2000 raw materials, after working them into the paint and varnish materials, not to speak of their identification in the dried films or of their truly quantitative estimation. In many instances, even the composition of these raw materials is unknown.

All hopes in this direction may be considered Utopian measured by the present state of development, but it should be possible to decide basic questions such as the pigment contents, amounts of esters in solvents, oil and nitrocellulose contents, etc.

Paint and varnish materials are usually composed of the following constituents: Solvents, Vehicles, and Pigments.

Pigments

MOST of the early work in this direction has been carried out not by paint and varnish experts but by metallurgical chemists and analysts. Existing specifications contain numerous prescriptions for the chemical analysis of metallic compounds such as lithopone, sulphate-white lead, titanium white, etc.

However, in spite of the directions given in the specifications, a number of difficulties still exist with regard to the analysis of pigments. For instance, the isolation of the pigments by means of the incineration of paint and varnish samples cannot be recommended, since this method may lead to the formation of volatile inorganic constituents such as antimony oxide. A much better way appears to be the extraction of these constituents by suitable solvents, followed by centrifuging of the products of extraction.

Ship-bottom Paints

BUT even this method may lead to erroneous results. For instance, ship-bottom paints usually contain besides their common pigments a certain percentage of cuprous oxide acting as poisonous antidote against the growth of algaceous, fungus growth, seaweeds, etc. This cuprous oxide is partly soluble in acid vehicles, so that if paint materials of this type are subjected to the ordinary methods of extraction as a matter of routine, a certain portion of this substance may not be found in the solid residues of this treatment but in the liquid portions of the mixtures of reaction.

It is thus obvious from this short outline of the possible difficulties that the analytical determination of the pigment contents of paint and varnish materials requires a close consideration of each and every individual case before deciding on the method of analysis selected.

But the difficulties do not end there; even the approved methods of metal analysis must be critically examined before they are applied to the inorganic pigments of paint and varnish materials. It is not customary even to the metal chemist to determine quantitatively such heterogeneous mixtures as, for instance, mercury, copper, arsenic and large quantities of iron oxide which are frequently encountered together in the case of ship-bottom paints and others.

There are a large number of mercury determinations, but we have found only one of them applicable to the purposes of the paint and var-

is of PAINT

By Dr. D. G. Zeidler

nish chemist, the well-known Esch-ka-method by which the mercury is evaporated in a crucible closed with a pure gold lid, which collects the mercury vapors in form of an amalgam.

Samples

ANOTHER determination difficulty encountered in the analysis of paint and varnish materials which is not sufficiently realized by many chemists is the problem of obtaining reliable average samples of the material to be analyzed. This is partcularly the case where the pigments exhibit a high velocity of sedimentation, i.e. where it is difficult to maintain the paint or varnish material in a state of absolute homogeneity. Again, the above-mentioned ship-bottom paints are as typical example. Sometimes it is found necessary to employ two persons for the simple procedure of weighing out a fair average sample, one of them doing the stirring, the other one the sampling and weighing.

Analysis of Solvents

THERE are a considerable number of publications on this subject, including a few books, containing useful directions as to the analysis of solvent mixtures. The trouble is that in many special instances the directions given do not suffice to divide the mixtures up into their various constituents. It is true that in many cases satisfactory results can be obtained. In one particular instance, the author was called upon to determine the reason for the poisoning (with deathly results) of a painter applying a qualitatively good varnish containing a poisonous solvent within closed rooms. A chemical analysis of the varnish proved the presence of the poisonous ethene tetrachloride—which explained the toxic properties of the varnish.

However, in most practical instances, conditions surrounding the complete analysis of paint and varnish materials and the determination of definite constituents are much more complicated, the chief reasons for this fact being the following:—

Distillation

FRACTIONAL distillation, which is usually specified for white spirit, frequently is misleading due to the great number of azeotropic mixtures employed. Indeed, the number of these substances steadily increases, so that it is very difficult to form reliable deductions as to the particular range of boiling temperatures involved.

There is hardly any other industry employing so many different ingredients for solvent purposes, and it does not suffice, for this reason, to specify: "—must not contain more than 10 percent of benzene" or "—methylene chloride must not be used". Specifications and directions of this type must always be accompanied by directions as to the chemical method to be employed in the analytical determination of benzene or methylene chloride in the varnish mixtures investigated.

However, in many cases the analysis of varnishes or solvents need not be carried so far as to include all basic ingredients; it usually suffices to determine the main constituents such as alcohols, esters, aromatic hydrocarbons and ketones. These determinations can be effected with a sufficiently high degree of accuracy by determining the characteristic index numbers.

Analysis of Vehicles

THE chemical examination of vehicles represents the most difficult part of paint and varnish analysis, although the analysis of fats and fatty substances has gradually attained a comparatively high standing due to the researches of authorities such as Kaufmann and his associates. Much of his work has been adapted to the analysis of vehicles and varnishes generally, although there still remains a considerable number of difficulties due to the following reasons:—

1) Paint and varnish materials contain innumerable mixtures of natural and synthetic resins and oils.

2) The production of paints and varnishes and the drying processes involved are characterized by many chemical changes of the original raw materials entering these mixtures, which renders the application of the numerous chemical analyses of fatty substances (as devised especially for fats, etc.) impossible.

Fatty Acids

FATS themselves can be easily characterized by index numbers, but this does not apply to the varnish vehicles in general. Just to mention one single substance, a phenol resin. It is possible with these resins to produce air-drying, acid-hardening and baking varnishes. What can one expect of a chemical analysis of such a material? It is obvious that the resin or, rather, the resin con-

tained in a baked varnish film represents an entirely different substance than the same material after air-drying or acid-hardening. We thus have three different substances, all derived from one and the same raw material. There can be no doubt, for this reason, that a chemical test or analysis of varnish vehicles must be developed especially for the purposes of the paint and varnish industries and that it is impossible in many cases to adopt chemical methods of analysis from the industries of fats and waxes, etc.

There have been numerous investigations with a view to develop special methods of this type, which in Europe have been conducted almost exclusively by Dr. H. Wolff and C. P. Kappelmeier (See index of literature at the end of this article). We call attention to the ingenious determinaton of phthalic acid in vehicles containing alkyd resins which has been incorporated in some specifications.

Nitrocellulose and Amine Resins

FREQUENTLY, it is necessary in connection with the investigation of paint and varnish mixtures to determine urea resins besides nitrocellulose. Both substances contain nitrogen, so that the determination of this element by simple chemical analysis is meaningless as far as the identification of these two substances is concerned. H. Wolff developed a method for the determination of nitrate (unpublished) which is too complicated for practical purposes, however. C. P. Kappelmeier, on the other hand, was able to solve this problem by the development of the "Aniline test".

This method represents a simple laboratory test carried out as follows:—

The paint material to be tested is treated with aniline which in presence of a urea resn causes the formation of diphenyl urea, a substance identified by a melting point determination. Another product of this reaction is ammonia which is liberated, signifying the presence of an urea resin by the intensive odor of this substance.

A similar method of determination is that devised by C. P. Kappelmeier for the presence of melamine resins in paint materials. This test is carried out by the addition of, and reaction with cyanuric acid which on heating the mixture of reaction is transformed into the characteristically smelling hydrocyanic acid.

A constituent of nitrocellulose lacquers which has played a rather important part of late is the sulfonamide resin, or rather a group of resins carrying this name. C. P. Kappelmeier suggested to subject the paint materials containing these resins to a chemical determination of paratoluol sulfonamide.

The above few points raised by us suffice to prove that the modern chemical testing of paint materials has already advanced to a point which by further development will gradually lead to a satisfactory chemical series of tests. It is not the purpose of this paper to dwell on further special problems of the chemical analysis of vehicles.

Oil Content

IT may be of interest in connection with this short discussion of the main problems of chemical testing of paint and varnish materials to call attention to another question closely related to these problems: What is understood by the term "oil" in paint materials? It is a well-known fact that a number of specifications incorporate directions regarding specific oil contents of varnishes, and that since these specifications were enacted, general scientific and industrial conditions have been considerably changed. The term "oils" in these specifications referred to the natural oils. What changes have been effected in the meantime?

The development of the oxidation of paraffine has lead to a large number of fatty acids, some of which have already been known for a long time while others had formerly been unknown since they are not existent in nature. These fatty acids are now extensively used as a new material in the production of paints and varnishes—for instance, as alkyd resins or as plasticizers.

Now, while the natural oils consist almost completely of carbon chains with even carbon atoms (such as 12–24 atoms) within the glyceride, the fatty acids also exhibit carbon chains with uneven numbers of carbon atoms which are not, or but rarely, represented in the substances formerly called *oil* exclusively. It is true that the fatty acid fraction containing 14 to 20 carbon atoms is not often employed in the production of varnishes, but this does not change the principle.

The question now arises whether it is permissible to call a varnish "oil varnish" if it contains a synthetic oil differing from natural oils by the uneven numbers of carbon chains of their fatty acids, or if, for instance, linseed oil-fatty acids esterified with pentaerythritol may correctly be termed "oil" in the sense of these specifications. It is quite certain that sooner of later we have to come to a decision as to the point, up to which a fatty acid glyceride may really be termed an oil. For instance, butyric acid exhibiting four carbon atoms represents a member of the fatty acid series, but nobody will really dare to claim that the glyceride of this acid can be termed an oil.

This question is of considerable basic importance, but it became acute only after the introduction of chemical analysis in the production and application of paint and varnish materials.

In determining the oil contents of a paint material it does not suffice to separate the uric acid by esterification. It is necessary at least to determine the acid number of the fatty acids obtained by saponification. It is possible by this means to get an idea as to whether the fatty acids produced are of the molecular size of the real fatty acids.

For some time past we have introduced in our laboratory a new method involving the distillation of the fatty acids with hydrogen, since the low-molecular fatty acids are volatile with hydrogen. A similar method is used in the determination of the Polenska number and the Reichart-Meissel number used in the analysis of fats.

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. . . RUBBER PAINTS

(*From Page 10*)

0.5% acetic acid quickly into the latex. The coagulum is then squeezed, creped and washed in flowing water between rollers, after which it is dried at 50° C. and weighed.

For rough calculations with normal latex the dry rubber content may be taken at 93% of the total solids.

The simplest and quickest method is direct titration with standard acid. A few cubic centimeters of the latex are placed in a beaker, diluted with water and titrated with standardized acid (hydrochloric or sulfuric), a suitable indicator being used.

Maintaining Uniformity

GREAT advances have been made manufacturing processes direct from latex and in the volume of latex consumed. All users have soon found, however, that not every shipment of latex was like the previous one, and this variation in uniformity has required even more careful handling in checking the variations in standard sheet. As the burden of the complaints has probably fallen most heavily on those importers in this country who have specialized in supplying various forms of latex to consumers, some of them have already made extensive investigations in collaboration with the Rubber Research Institute of Malaya. Others have adopted standard commercial procedures to obviate these variations.

The guarantees under which latex is generally sold are that it shall contain the stated amount of natural rubber solids, and that it shall be free from coagulation and/or putrefaction. While most sellers maintain these guarantees, it is well known that ordinary latex as it enters this market varies decidedly in other respects, in the amount of sludge or sediment, in the color, in the proportions of non-rubber constituents, and in the rate of cure of the deposited rubber. All these are matters that concern a manufacturer in continously making a uniform finished product.

A comparatively simple method of obtaining uniformity adopted by one concern is to bulk the latex in large tanks and to submit samples of such bulkings in advance of the user's actual requirements. Such samples are subjected to a series of simple control tests and either rejected or accepted. Thus, the natural variations, instead of occurring between 50 gallon drums, are minimized to lots of 1,000, 5,000, or 10,000 gallons, and are checked by the buyer before the latex is taken in.

Such bulked quantities of latex are, where necessary, clarified mechanically, i.e., by a centrifugal clarifying machine which removes any suspended sludge, precipitate or foreign matter. Such latex is usually classed as Grade A, and sells at a slight premium over the average market grades.

Practically all latex entering the U. S. is imported through the ports of Boston and New York, near which most of the firms supplying latex are situated. Latex is generally stored under "in transit" arrangements and finally delivered in 50–55 gallon steel drums or tank cars. Although there has been a very large increase in the use of concentrated latex in the past three years, particularly among manufacturers of rubber goods in volume at least, normal latex still constitutes by far the greater percentage imported into and used in this country.

Concentrating Latex

CONCENTRATING latex was born of the fact that ordinary latex contains 50% or more of useless water, the transportation charges on which are higher than those on the actual rubber.

As matters stand today, however, the cost of concentrations appears to be higher than the cost of transporting the water removed. At least, the concentrated article sells at a premium over the normal product per lb. of dry rubber. Nor is all the concentration being done in the producing countries.

There are four known methods of concentrating latex—namely, Evaporation, Centrifuging, Creaming, and Filtration. Only the first three methods are used on a large commercial scale, and each method produces a product of somewhat individual characteristics.

With suitably designed apparatus latex can be evaporated to commercial concentrations as high as 75%. The evaporated latices that have appeared on the market usually contain the whole of the natural latex solids, and in addition thereto, protective colloids of a soapy nature. Such protectives are added to assist in the evaporation process and to prevent coagulation during evaporation and in the final product. Concentrated latex prepared by this method has largely been useful in the field of adhesives and in highly filled compounds.

Crude and Reclaimed Dispersions

WATER dispersions of crude and reclaimed rubber have passed the experimental stage and are now more or less common products on the market. A water dispersion is in reality a suspension of small particles of solid or semi-solid material which are held in suspension and kept apart or stabilized by a suitable protective colloid. The various protective colloids and the details of their use are

TABLE II

Specific Gravity	Gms. Rubber per 100 cc.	Lbs. Rubber per Gallon	Lbs. Rubber per Lb. Latex
.9504	60	5.00	0.625
.9620	50	4.16	0.541
.9678	45	3.75	0.462
.9736	40	3.32	0.426
.9794	35	2.91	0.372
.9852	30	2.50	0.317
.9910	25	2.08	0.262
.9968	20	1.66	0.208
1.0003	17	1.41	0.1762
1.0026	15	1.25	0.1558
1.0084	10	0.83	0.1028
1.0142	5	0.41	0.0505
1.0200	0	0.00	0.0000

the subject of a number of patents.

Before preparing a dispersion of rubber it is desirable first to plasticize and compound the dry rubber, crude or reclaimed, either in a Banbury mixer or on a mill, omitting the sulfur and accelerator. Then the actual dispersing operation is subsequently carried out in either a Banbury or Werner-Pffeiderer type of mixer.

A thick paste of the protective colloid is prepared, placed in the mixer and warmed slightly. The rubber compound is then warmed up on an open mill and added to the paste in the mixer. The rubber and the paste are then allowed to masticate to a uniform mix, until at a suitable stage in this operation the dispersion is diluted gradually with water to the desired consistency. For example, for brush work the viscosity is high, while for spray application it is low.

During the early stages of dispersing, the sulfur is added to the batch and rubbed into the thick dispersion, but the accelerator is not added until the dispersion is complete, or just before it is to be used.

The types and grades of water dispersions which are available are: (1) A dispersion of pale crepe. (2) A dispersion of smoked sheets. (3) A dispersion of inner tube reclaimed compound to give a dry film of low elasticity but with excellent bonding strength. (4) A dispersion of inner tube reclaim compounded to give a dry film which is very elastic, lively and strong, more on the order of the latex film. (5) A dispersion of uncompounded inner tube reclaim containing nothing but reclaim, protective colloid and water. This product is meant primarily for use in factories where the customer desires to do his own compounding. Special grades of water dispersions are also available according to individual requirements.

Processing

DUE partly to the nature and quantity of protective colloid, water dispersions are frequently more stable than latex so that processing is more simple than the latex. The methods of processing are much the same for both latex and water dispersions. Whiting, clay, barytes, starch, casein, gums, latex and other materials may be added simply by stirring.

In preparing mixtures of latex and water dispersion, the dispersion may first be deliberately over-compounded —that is an extra amount of sulfur, antioxidant, zinc oxide and accelerator may be worked into the dispersion during the mixing, and then the desired amount of latex added later. This method simplifies the process of compounding latex for the user since the latex is added simply by stirring. Thus a cured, well-aging film is obtained at a lower cost than that which would result from compounding the latex alone. When adding water dispersions to solutions of starch, gums or similiar sizing materials it is not necessary to cool the size first as the dispersion stirs in readily. The mixing equipment may be of almost any type.

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Paint & Varnish Exchange Club Holds Interesting Meeting

The Paint & Varnish Exchange Club, Inc., held a very successful and interesting meeting on February 14, 1950 at the Taft Hotel, New York City. About fifty members and guests attended this meeting despite slippery, sleety roads and stormy weather.

The members and guests had dinner in the Tap Room of the Hotel Taft. Benjamin Joachim, President of the Club, called the meeting to order at 7: 45 P.M. with Secretary Dana Johnson reading the minutes and Treasurer Thomas Curran giving the bank balance. Vice President Jack Binswanger, who traveled from his home in Philadelphia to attend the meetings, gave a short history of the club, reviewing its purposes. Various committee chairmen made their reports. These included Wallace France—Entertainment, Fred Gartenlaub—Employment, Dr. Walter B. Maass—Program, Reuben Weinstein—Library, Jack Hathorne—Hospitality. The fifteen new members were formally admitted to membership. New applications for membership will be acted on before the next meeting.

The guest speaker was George S. Cook—Project Engineer of the Engineer Research and Development Laboratories, Fort Belvoir, Virginia. Mr. Cook's subject was "Protective Coatings in the Corps of Engineers." His talk was an excellent presentation, illustrated by colored movies and many projection slides. Reuben Weinstein operated the projector. The second speaker was a member of the club—Dr. Walter B. Maass, who spoke on "American and European Paint Making."

BOOKS & REPORTS

Allyl Halides

Published by the Shell Chemical Corp., 500 Fifth Ave., New York, N. Y., or 100 Bush St., San Francisco, Calif., and is available on letterhead request.

Intended to serve as a primary source of information on allyl chloride, fluoride, bromide and iodide, the book combines in one volume a comprehensive review of published literature with hitherto unpublished data from the research and engineering staffs of Shell Development Company.

Over half of the book is devoted to a discussion of allyl halide reactions, which are classified by type and include compounds formed by the independent or simultaneous reaction of the olefinic bond and the halogen atom. A description of physical properties includes infrared and ultraviolet spectra. Storage, handling, specifications and test procedures are outlined.

Unusual features of the book are a 716-reference bibliography and a 14″ x 17″ fold-out chart which diagrammatically summarizes the reactions of the allyl halides.

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Reid Directing National Lead Titanium Activities

National Lead Company has announced that all activities of its titanium division are under the direction of Joseph H. Reid. Mr. Reid is manager of the division, and Mr. Robertson will continue in a consulting capacity.

Mr. Robertson joined the company in 1926 in a sales capacity for Titanium Pigment Company, Inc. He was made head of Titanium's paint development laboratory in 1933, then became successively a vice-president and director of Titanium Pigment Corporation, manager and general manager of the Titanium Division.

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Falk Elects S. Aronoff V. P.

Falk & Company of Pittsburgh, Pennsylvania, one of the country's leading producers of linseed oils, soya oils, fish oils and alkyd resins, has announced the election of Mr. Samuel Aronoff as vice-president in charge of eastern sales. Mr. Aronoff has had a wide and lengthy experience consisting of 22 years in the manufacturing and marketing of raw materials for the protective coating industry.

. . . GRAPHITE

(*From Page 11*)

that they will not interfere with any of the desirable interactions between the active pigments and the vehicle constituents. There really are very few pigments exhibiting no chemical activity whatever, the only scaly pigments exerting absolutely no chemical reactions within the paint films being iron mica and graphite. Nevertheless, both of these pigments, especially graphite, improve the anticorrosion properties of the films on account of their scaly arrangement resembling that of the scales of a fish or the shingles of a roof.

Machine Paints

GRAPHITE is a typical pigment for glossy as well as flat *machine paints* for practically every purpose, its perfect chemical resistance and inactivity rendering it unequalled by any other type of black or colored pigments. This applies to the black paints as well as to the gray varieties in which graphite powder is mixed with suitable amounts of neutral white pigments, chiefly lithopone and titanium dioxide. The chief requirements made for these paints are that they dry quickly and that the films are perfectly resistant to oils, oil-water emulsions, soap-solutions or any of the other lubricants and cooling liquids.

It is obvious, of course, that these requirements cannot be filled by all types of vehicle mixtures although a very large percentage of natural and synthetic products can be employed in connection with graphite as pigment. Natural and synthetic shellacs and Manila copals may be used. The latter form very glossy films, their only difficulty being their low drying speeds if applied on metal surfaces. The last traces of solvent frequently remain in the film for a week or longer, especially where comparatively large quantities of graphite are used, and it is practically impossible to put machines such as, for instance, lathes, milling or boring machines into operation until the paint films are absolutely dry.

The choice of machine paint combinations is also rendered more difficult by the fact that they must be elastic and blow-resistant in order to withstand the abrasive or cutting action of dropping tools or metal pieces, etc. In many cases the paint films are also subjected to the action of heat up to about 250 degrees Fahrenheit.

It has become a custom to add certain proportions of colophony to the machine paint mixtures in order to reduce the cost of production. There can be no doubt that limited percentages of this resin (the maximum amounts depending on general compositions) do not impair the value of the paints, while excessive proportions of this resin reduce the mechanical, chemical and heat resistances of the films considerably. Much depends also on the type of pigments added. It has been found, for instance, that if certain active pigments such as titanium dioxide or lithopone are used in addition to graphite/the amount of colophony can be considerably increased.

The same applies in a certain sense to the use of manila copals—which really seems to represent the most generally used resin in high grade machine paints. It is a fact that the drying capacity of the combinations containing Manila copal, graphite and an active white pigment is rather more pronounced that in similar mixtures containing only graphite (and lampblack) as pigments. Lampblack itself is about as neutral as crystal graphite, but there are now various types of activated carbon black which assert themselves in a similar manner.

Another type of resins frequently used in connection with machine paint compositions are the acaroid resins which develop films of very high gloss and of considerable chemical and mechanical resistance especially in connection with crystal graphite flake powder, a small percentage of active carbon black improving conditions perceptibly. The one disadvantage of these resins, their very dark solutions and the reduction of gloss induced by comparatively large additions of active pigments is of no account in graphite paints, of course. These factors really are disadvantageous in colored or white paints, especially in view of the fact that acaroid resin paints must exhibit a high degree of consistency if the glossiness of the films is to be preserved.

Active Pigments

PRACTICALLY all active pigments can be used together with graphite flake powder, but these pigments must not contain the oxides of lead or zinc. Cheap lithopones, which frequently contain zinc oxide, must not therefore be used in the manufacture of gray machine paints since on account of the highly basic character of these oxides they tend to turn thick in spirit varnishes. The hard masses formed act against the formation of glossy films. The same applies to titanium dioxide containing zinc oxide which may be satisfactory in other paints for wood surfaces but not for glossy machine paints.

Where exceptionally hard resins are used to obtain hard and resistant glossy machine paints it is necessary to add softeners such as oil of turpentine, calipot, castor oil, tricresyl phosphate, etc., but attention must be paid to the commercial grades of oil of turpentine which exhibit widely varying compositions, while approved glossy machine paint formulas should be strictly maintained in order to insure optimum physical and chemical properties. It should be remembered that since graphite is an entirely neutral pigment, the vehicle must be composed so as to obtain maximum properties without the co-operation of the pigment.

Effect of Other Resins

IT is a matter of experience that some of the machine paints containing besides manila copal some other resin solutions tend to develop thick graphite pastes which often cannot be satisfactorily dissipated even on grinding. This is due merely to wrong mixing of the spirit solutions of these resins. It is necessary to add the manila copal solution to the other resin solutions slowly and under constant stirring. Another reason for this difficulty are unsatisfactory mixing ratios, which are rather constant for all compositions. For instance, 10 parts of manila copal and 3 parts of oil of turpentine require 18–19 parts of 96 percent alcohol, while if the same quantities of

shellac and oil of turpentine are used, 40 parts of 96 percent alcohol should be employed. 10 parts of acaroid resin and 3 parts of oil of turpentine require 22–24 parts of 96 percent alcohol, while 10 parts of colophony and 3 parts of oil of turpentine go with 18 parts of 96 percent alcohol. Wherever colophony is used in these mixtures, not more than 25 percent of the standard solution mentioned should be added. Higher percentages do not interfere with the gloss but deteriorate the mechanical properties of the films as well as their resistance to oil and soap solutions, particularly their elasticity. Additions of up to 5 percent of castor oil or linoleic acid improve the degree of elasticity. Higher additions of these substances prolong the drying periods, causing sticky films of low chemical and mechanical resistance.

Amount of Pigment

As to the amounts of pigment added, graphite paints do not require quite as much manipulation as the paints containing active pigments. Many straight graphite paints contain as much as 5 to 6 parts of graphite for 10 to 12 parts of resin, others yield good results with 2 parts of graphite in 10 parts of resin, provided the graphite is ground to a sufficiently fine powder. If carbon black (lamp-black) is used along with graphite powder that ratio should be about 1:4 to 1:5, depending on the kind of corrosion stresses involved. Where the paint is to be subjected to oil, soapwater and elevated temperatures, the carbon black-graphite mixture should not exceed a ratio of 1:10.

Dark gray paint films do not require very much graphite, since its coloring capacity is quite considerable. For a commonly used dark grey color, the mixture should contain about 25 parts of manila copal solution 4 parts of good lithopone for titanium dioxide and 1 to 1.5 parts of graphite.

Asphaltum Lacquers

ATTENTION should finally be called to a type of cheap machine paints frequently used in Europe (especially after the war) for most types of working machines, the "asphaltum lacquers". These lacquers may be genuine asphaltum combinations containing high grade glesonite asphalts or equally good grades of asphalt, 1 part of these materials being mixed with about 2 parts of a mixture containing equal parts of oil of turpentine and tetraline. 1 part of graphite is ground into about ten parts of these mixtures. The cheaper grades of "asphaltum lacquers" often contain no asphalt at all but are mixtures of anthracite pitch, colophony and coal oil. It is obvious that these cheap mixtures are not as resistant as the genuine asphaltum paints, but their quality is considerably improved by the addition of graphite powder, even if this contains considerable amounts of amorphous graphite to keep the prices down.

Where glossy machine paints are not desired, *flat paints* are usually made by adding some wax to the vehicle mixtures. These products are not as satisfactory however, since the films produced, while chemically resistant, do not develop sufficient hardness and tenacity to withstand the scratching and blowing stresses to which machine paints are frequently exposed. A very useful paint of this type exhibiting high chemical and mechanical resistance and a pleasant semi-glossy flat appearance is made up as follows:—

Solution 1:—30 parts of boric acid, 20 parts of lacquer black, 10 parts naphthalene, 400 parts ethyl alcohol.

Solution 2:—240 parts of shellac, 400 parts of ethyl alcohol.

Both solutions are filtered and combined. This vehicle is then mixed with graphite powder, the common ratio being 10–12:1.

Acid Resistant

THE third group of graphite paints, the *acid-resistant paints,* have been covered in a number of publications, including that on Some Practical Observations on the Production of Acid-Proof Paints and Varnishes by Dr. A. Kufferath in this journal. (Vol. XXIX, No. 2). All the resins, synthetic resins, oil and solvent combinations mentioned in this latter article can be used with the acid-proof graphite paints. Besides, most of the graphite paints mentioned under the heading anti-corrosion and machine paints are more or less acid proof. Indeed, it is often rather difficult to find more acid-proof combinations where the mechanical properties must also be at their best.

Somewhat different conditions prevail, where acid resistance is by far the most important property and mechanical resistance is not a most important feature. Instances of this type are:—many laboratory instruments and fixed equipment in chemical works, such as pipe lines and other overhead equipment rarely touched by the crew and exposed only to the chemical action of fumes, gases or eventually liquid drops or particles of the chemicals in question. It is practically impossible here to consider every and all these chemicals. Graphite itself is absolutely resistant against every chemical, in contrast to practically every other type of active or inactive pigment including even titanium dioxide, which in our opinion represents the most valuable white pigment for acid-proof paints. It is for this reason that only the resin-oil-solvent combinations need be considered in connection with graphite powder as pigment in acid-proof paints.

Alkyl Types

ALKYL resin-fatty acid combination with triethylene tetramine and benzene as solvents are frequently used. For instance:—

500 parts (by weight) of alkyl resin modified with 50 percent fatty acid.

30 parts powdered flake graphite mixed with 5–10 parts of active carbon.

250 parts benzene, 30 parts triethylenetetramine.

In Europe phenol resins are most frequently employed as base material for the production of acid resistant paints and varnishes, not only for iron and non-ferrous metal surfaces but for the acid-proofing of wood and other organic materials, natural or synthetic. Their products combine the advantages of high chemical and mechanical resistances with those of high degrees of non-combustibility, adherence and gloss.

A very acid-resistant paint or varnish base is produced as follows:—

An alkyd resin modified with natural resins or a modified phenol aldehyde resin is mixed with glycerine or a high-grade glycerine substitute and the mixture maintained at a temperature of 490 degrees

Fahrenheit for about 20 minutes. A current of carbonic acid gas is then conducted through the warm mixture for about 15–20 minutes. Wood oil and linseed fatty acids are then added and stirred at the above mentioned temperature of 490 degrees Fahrenheit until a completely clear solution is attained.

After lowering the temperature to 450 degrees Fahrenheit we then add phthalic acid and esterify in a current of carbonic acid until the acid number of the mixture has reached 10. The temperature is then further lowered to 350 degrees Fahrenheit and the mixture treated with a current of warm air, the reactions required being aided by the addition of catalytic substances such as cobalt or lead acetate, caustic soda or sodium carbonate. The final product obtained by this process is thinned with toluol. Black acid-proof paints are pigmented with powdered flake graphite and small percentages of active carbon black, while the dark or light gray varieties are obtained by additional proportional quantities of titanium dioxide.

In order to be considered standard acid-proof paints, numerous specifications have been developed. In Continental Europe the following requirements are most customary:

One hour exposure of the perfectly dried films in

1) Sulphuric acid of 50–55 degrees Beaumé, or

2) Hydrochloric acid solution 20–35 percent, or

3) Nitric acid solution, 30–50 percent all at a temperature of 200 degrees Fahrenheit and a specified number of hours under the same chemical corrosion stresses at room temperature. In most instances, the prolonged action at room temperature must follow the one hour exposure at 200 degrees Fahrenheit. As a rule, all films are somewhat affected by these treatments, but they must not be corroded sufficiently to interfere seriously with their further application under ordinary practical conditions.

Note: Acaroid resin is natural accroyes and colophony is ordinary rosin.

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Correction

Regarding the item on chrome greens which appeared on page 24 of the February issue, the complete address of the Sherwin-Williams Co. is 115th St. and Cottage Grove Ave., Chicago, Ill.

CALENDAR OF EVENTS

Mar. 28–31. National Plastics Exposition, Navy Pier, Chicago, Ill.

April 4–7. National Association of Corrosion Engineers Conference, Hotel Jefferson, St. Louis, Mo.

April 24–27. National Packaging Exposition of the American Management Association, Navy Pier, Chicago, Ill.

April 25. Association of Consulting Chemist and Chemical Engineers Meeting, Shelburne Hotel, New York, N. Y.

April 25–26. Metal Powder Show and Annual Meeting, Book-Cadillac, Detroit Mich.

May 1–3. American Oil Chemists Society, Atlanta Biltmore Hotel, Atlanta, Ga.

May 15–17. National Cottonseed Products Association Meeting, Shamrock Hotel, Houston, Texas.

June 26–30. 1950 A. S. T. M. Annual Meeting and Exposition of Testing Apparatus and Equipment, Chalfonte-Haddon Hall, Atlantic City, N. J.

Nov. 9–11. Federation of Paint and Varnish Production Clubs Convention, Congress Hotel, Chicago, Ill.

Nov. 15–18. National Paint, Varnish and Lacquer Association Convention, Fairmont Hotel, San Francisco, Calif.

PATENTS

Conducted by

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PATENTS AND COPYRIGHTS

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Rubber-Like Polyesters

U. S. Patent 2,489,711. David W. Jayne, Jr., Old Greenwich, and Harold M. Day, Cos Cob, Conn., assignors to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A rubber-like product obtained by heating at 180° to 220° C. an omega-hydroxy saturated aliphatic carboxylic acid with a glycol acid ester of an alpha, beta-unsaturated dicarboxylic acid in a molar proportion from 1:0.5 to 1:1 and curing the reaction product obtained by heating in the presence of an organic peroxide catalyst, said ester being prepared from equimolar proportions of glycol and dicarboxylic acid.

Polymerization of Diolefins

U. S. Patent 2,490,712. Walter A. Schulze and Willie W. Crouch, Bartlesville, Okla., assignors to Phillips Petroleum Company, a corporation of Delaware.

In the manufacture of a synthetic rubber-like material by copolymerization of a monomeric material comprising a major portion of butadiene and a minor portion of styrene while dispersed in aqueous emulsion in the presence of a soap emulsifying agent and in the presence of potassium persulfate as a polymerization catalyst under polymerization conditions, the improvement which comprises conducting such polymerization in the presence of an aliphatic monohydric saturated alcohol having at least 5 and not more than 7 carbon atoms per molecule in an amount from 4 to 10 parts by weight per 100 parts of said monomeric material.

Thiophene-Turpentine Resins

U. S. Patent 2,490,270. George C. Johnson, Woodbury, N. J., assignor to Socony-Vacuum Oil Company, Incorporated, a corporation of New York.

A novel composition of matter consisting of the reaction product obtained by reacting about 0.5 to about 4 moles of a thiophene having two hydrogen atoms of the thiophene nucleus replaceable and one mole of turpentine in the presence of a Friedel-Crafts type catalyst; said reaction product containing 2.2 to about 15 weight per cent sulfur and 0.94 mole to 10.1 moles of turpentine per mole of thiophene reactant.

Rubber-Like Polymers

U. S. Patent 2,490,001. David W. Jayne, Jr., Old Greenwich, Harold M. Day, Cos Cob, and Edward L. Kropa, Old Greenwich, Conn., assignors to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A rubber-like product obtained by heating at about 180°–220° C. a monoalkylolamine of the formula HO—Y—NHR in which Y is a divalent saturated hydrocarbon radical and R is selected from the group consisting of hydrogen and saturated hydrocarbon radicals with a saturated aliphatic hydrocarbon dicarboxylic acid which does not form an anhydride upon heating, reacting the product so obtained with a glycol acid ester of an alpha, beta-unsaturated aliphatic hydrocarbon dicarboxylic acid, the molar proportions of saturated acid to alkyloamine to glycol acid ester being from 1:1:0.15 to 1:1:0.3, and then curing the reaction product by heating in the presence of an organic peroxide catalyst.

Resinous Condensates

U. S. Patent 2,489,366. Herman A. Bruson, Rydal and Warren D. Niederhauser, Philadelphia, Pa, assignors to Rohm and Haas Co., Philadelphia, Pa., a corporation of Delaware.

A process for preparing resinous materials which comprises condensing by heating together an aldehydo non-aromatic carboxylic acid, having one aldehydo and one carboxylic group as the sole reacting functional groups thereof and having two to sixteen carbon atoms in a chain between said functional hydrogen-bearing amine groups, at least groups, and a polyamine having as the sole reacting functional groups thereof one of which is a primary amine group, said amine groups being separated by a group containing at least four carbon atoms, the amount of said polyamine being reacted providing a proportion of a said primary amine group which is chemically equivalent to the aldehydo group of said carboxylic acid.

Plasticizing Elastomers

U. S. Patent 2,493,843. John Richard Vincent, Newport, Delaware, assignor to E. I. du Pont de Nemours and Company, Wilmington, Delaware, a corporation of Delaware.

The process of increasing the plasticity of an elastoprene of the class consisting of natural rubber and the polymers of 1,3-butadiene and of 2-chloro-1,3-butadiene which contain at least 50% of the 1,3-butadiene compound, which comprises intimately incorporating in such material in the unvulcanized form from 0.1% to 5.0% of an anilide of a beta-keto acid of the formula R—CO—CH_2—CO—NHR′, wherein R stands for a radical of the group consisting of phenyl and naphthyl radicals and alkyl radicals of from 1 to 6 carbon atoms, and R′ stands for a radical of the group consisting of phenyl and naphthyl radicals.

Chloroprene Polymers

U. S. Patent 2,494,087. George H. Daniels, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Delaware, a corporation of Delaware.

An improvement in the process for preparing polychloroprene by emulsion polymerization of chloroprene which contains from 0.01% to 0.2% of carbonyl compounds as impurities and wherein the polymerization is carried out in the presence of an alkyl mercaptan, which comprises carrying out the polymerization of the chloroprene in an aqueous alkaline emulsion having a pH of from 8.5 to 12.5 containing from 0.05% to 0.5%, based on the weight of the chloroprene, of a reducing agent selected from the group consisting of hydroxylamine, hydrazine, water-soluble sulfides, water-soluble hydrosulfites and water-soluble normal sulfites.

Polyamine and Wax Composition

U. S. Patent 2,495,283. James H. Werntz, Wilmington, Del., assignor to E .I. du Pont de Nemours & Co., Wilmington, Del., a corporation of Delaware.

A composition comprising a wax and a polymeric polyamine in the ratio by weight of from 1:5 to 1200:1, said polymeric polyamine being the product obtained by the reductive amination of a polymer of a monoolefin containing from 2 to 4 carbon atoms with carbon monoxide, which polymeric polyamine has a main carbon chain and amino nitrogens attached solely to members of the class consisting of hydrogen and hydrocarbon as lateral substituent groups with the nitrogen thereof directly attached to a carbon atom which is an integral part of said main carbon chain.

Isopropenyl Toluene Polymers

U. S. Patent 2,490,372. Arthur S. Nyquist, Cos Cob, and Edward L. Kropa, Old Greenwich, Conn., assignors to American Cyanamid Company, New York, N. Y., a corporation of Maine.

The method of preparing polymeric materials which comprises polymerizing, in the absence of a terpene and at a temperature not higher than about 110° C., a polymerizable composition containing an isopropenyl toluene and, as a catalyst for the polymerization, a seed obtained by treating an isopropenyl toluene with a catalyst selected from the class consisting of boron fluoride and complexes of boron fluoride, the isopropenyl toluene contained in the said polymerizable composition being the only aromatic compound having an unsaturated aliphatic substituent attached to the aromatic nucleus that is present in the said composition.

Cellulose Esters

U. S. Patent 2,490,164. George W. Seymour, Blanche B. White and Leonard J. Rosen, Cumberland, Md., assignors to Celanese Corp. of America, a corporation of Delaware.

In a process for the stabilization of cellulose acetate having an acetyl value of 55 to 57%, calculated as acetic acid the step which comprises treating said cellulose acetate with an aqueous solution containing 0.1 to 10% by weight on the cellulose acetate of a polyalkylene ether alcohol at 20 to 30° C., decanting the aqueous solution and then heating said cellulose acetate at a temperature of 130 to 160° C. and a pressure of 10 to 85 pounds per square inch for ½ to 6 hours in 10 to 30 parts by weight for each part by weight (dry weight) of cellulose acetate, of an aqueous medium of less than 5 parts per million alkalinity.

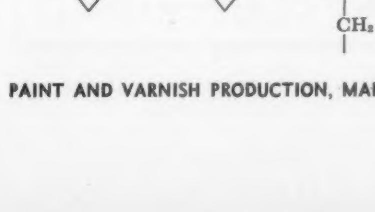
Polymeric Color Formers

U. S. Patent 2,489,655. Elmore Louis Martin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware.

A polyvinyl acetal of a hydroxyl polymer which contains a plurality of recurring

$$-CH_2-\overset{|}{C}HOH$$

groups and groups of the formula



Allyl Esters

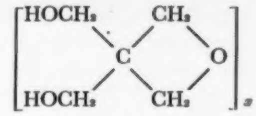
U. S. Patent 2,496,271. Jack Andrews Cottrell, Donald Helmsley Hewitt, and Frank Armitage, Homerton, London, England; Ernest Booth and Richard Hartlebury Buckle, both of London, England, executors of said Hewitt, deceased, assignors by mesne assignments to The Sherwin Williams Co., Cleveland, Ohio, a corporation of Ohio.

A monomeric polymerizable ester of an alcohol of the class consisting of allyl and methallyl alcohols and a Diels-Alder condensation compound of the type obtained by reacting a compound of the class consisting of maleic acid, maleic anhydride and lower alkyl esters of maleic acid and a conjugated monocyclic terpene.

Pentaerthritol Esters

U. S. Patent 2,495,305. Joseph A. Wyler, Allentown, Pa., assignor to Trojan Powder Co., a corporation of New York.

The esters of drying oil fatty acids with the dehydration product of pentaerythritol of composition represented by the type formula



in which x is an integral odd number within the range 1–7 and containing ether and alcohol groups in the ratio of 1 ether group to 2 alcohol groups.

Phenol Condensations

U. S. Patent 2,489,336. Raymond J. Spahr, Bainbridge, N. Y., William R. Moffitt, Seattle, Wash., and Everett H. Pryde, Beaver Falls, Pa., assignors to The Borden Company, New York, N. Y., a corporation of New Jersey.

A water soluble phenolic resin glue composition produced by reacting one mol of a mononuclear monohydric phenol selected from the class consisting of phenol, cresols, xylenols, and mixtures thereof with 1.0 to 2.5 mols of formaldehyde in an aqueous alkaline solution until a low condensed polymer is formed, adding, while maintaining the resulting condensation product at a temperature of 25 to 75° C., a mononuclear dihydric phenol selected from the class consisting of resorcinol, pyrocatechol and hydroquinone together with sufficient non-volatile alkali to maintain the mixture at a pH between 9.0 and 13.0, the amount of said mononuclear dihydric phenol added being 1.1 to 10 parts by weight per 10 parts by weight of said mononuclear monohydric phenol, and condensing the reaction mixture by heating until the resulting product has a viscosity between 30 and 200 revolutions per minute as determined on a Stromer viscometer at 70° F. using a 500 gram weight.

Coating with Siloxanes

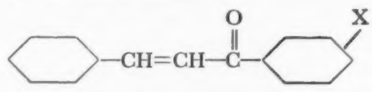
U. S. Patent 2,494,920. Earl Leathen Warrick, Pittsburgh, Pa., assignor to Corning Glass Works, Corning, N. Y., a corporation of New York.

The method which comprises applying a mixture of a toluene soluble organopolysiloxane in liquid state, an inorganic filler melting above 350° C. and a diacyl peroxide in amount less than 8 percent by weight based upon the weight of the polysiloxane but in amount sufficient to promote curing of the siloxane to a tack-free state, the filler being present in such proportion as to form a paste, to a base member to form a coating thereon of between 0.1 and 7 mils thickness, raising the temperature of said coating to at least 180° C. but not above 400° C. within 2 minutes and maintaining the temperature within the range of 180° C. to 400° C. until the coating is cured, the organic substituents of said organopolysiloxane being monovalent hydrocarbon radicals attached to the silicon through carbon to silicon linkages, there being on the average between 1.75 and 2.25 of said radicals per silicon atom and there being present in the siloxane at least 60 mol percent of the structural unit corresponding to the formula R_2SO where R is an alkyl radical, and said diacyl peroxide containing at least one aromatic acyl radical.

Styrene-Benzalacetophenone

U. S. Patent 2,496,697. Earl C. Chapin, Dayton, Ohio, assignor to Monsanto Chemical Co., St. Louis, Mo., a corporation of Delaware.

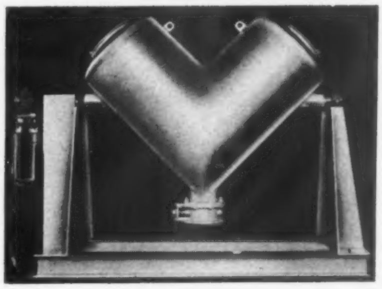
A copolymer of from 50 to 98 percent by weight of styrene and from 50 to two percent of a compound having the structural formula:



wherein X is a radical of the group consisting of methoxy and chlorine.

P&V NEW PRODUCTS & IMPROVEMENTS

A MONTHLY MARKET SURVEY



Patterson-Kelley

TWIN SHELL BLENDER

For Dry Materials

The Patterson-Kelley Company, announced the development of the P-K Twin Shell Blender.

Essentially it consists of two cylindrical shells of equal diameter but so joined together as to form a V rather than a long straight tube. This V-shaped unit rotates about a horizontal axis passing through approximately the geometrical center. At the apex or point of the V is located a dust-tight discharge valve; at the end of the two legs are located standard access covers with swing bolts and dust-tight gaskets. If necessary to prevent dust while loading, the machine can be set in the reverse position (Λ) and fed through the discharge valve.

Sizes of the P-K Twin Shell Blender range from 250 to 300 cubic feet capacity. Power requirement (based on materials of 50 lbs per cubic foot density) range from 1/4 to 20 hp. Other drives available for heavier products. Standard motors supplied are integral gearhead type with built-in magnetic brake for magnetic brake for close control in "spotting" the unit for charging and discharging. The Patterson-Kelley Co., 32 Burson St., East Stroudsburg, Pa. PVP—March.

PLASTICIZER

Polyester Type

A new polyester-type plasticizer has been announced by the General Electric Company's chemical department.

Designated G-E 2559, the new material is similar to G-E 2557 plasticizer but lower in cost. The new plasticizer is reported to have very good heat, light, and weather resistance, improved oil and water resistance, as well as improved nonmigrating characteristics. In comparison to G-E 2557, G-E 2559 plasticizer is higher in viscosity, not as light in color, and is less efficient, G-E says. It is suitable, however, for plasticizing polyvinyl chloride, ethyl and nitrocellulose lacquers, and chlorinated, natural, and synthetic rubbers.

Technical data and samples of G-E 2559 may be obtained from the Chemicals Division, Chemical Department, General Electric Co., Pittsfield, Mass. PVP—March.

MALEIC ANHYDRIDE

New Physical Form

Maleic anhydride in a newly developed physical form is now available in quantity from production facilities recently completed by Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation. The anhydride is being produced as small hollow cylinders approximately 1 3/4 inches in length, 1 1/4 inches outside diameter, and 1/4 inch inside diameter. This new form of maleic anhydride has the advantage of maximum surface area to permit rapid melting or dissolving. In addition, it is resistant to dusting and is easy to handle in normal plant operations. Carbide and Carbon Chemicals Div., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y. PVP—March.

UPENDING TOOL

For Barrel and Drums

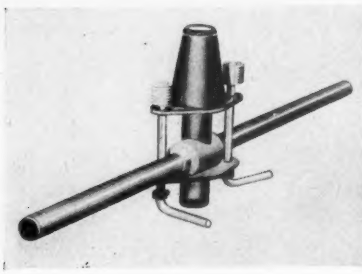
Barrels and drums may be upended without slipping or rolling by special leverage tool. This device is V-shaped with strapping iron saddles located at the point of lifting. As leverage tool is applied, pressure forces the saddles to spread and grip the drum surfaces to prevent slipping or rolling. D. S. Campbell Co., 6110 Euclid Ave., Cleveland 3, Ohio. PVP—March.

COLORIMETER

Rapid and Simple

Designed to speed routine processing analyses, the new industrial Rouy-Photrometer provides high accuracy obtainable in colorimetric absorption analysis. This improved type of photoelectric colorimeter, gives concentration readings in which inherent functional error is cut to within 0.1%. Such a high degree of accuracy is made possible for the first time by careful matching of the photoelectric cell and the microammeter, which results in strict linearity of current vs. light energy. Leitz, Inc., 304 Hudson St., New York 13, N. Y. PVP—March.

Leitz



Industrial Products

STOPPER DEVICE

For Tank Cars

Industrial Products Company announces a new stopper and unloading device for emergency use on tank cars.

Defective tank car outlet valves, lodged foreign material and other causes have resulted in total loss of material on the ground. With this stopper the wild flow may be stopped as soon as the device is in place. Contents may be unloaded through the device if desired, thereby eliminating the necessity of unloading from overhead.

Complete information may be obtained by writing to Industrial Products Company, 3035 N. Fourth Street, Philadelphia 33, Pa. PVP—March.

FLAME CONTROL UNIT

Automatic Shut-off

In case of flame failure in gas or oil heating units, this control unit will safely shut down gas or oil supply. This combustion safeguard uses the flame itself as link in switching circuit. It is supplied in inter-changeable units and is easily plugged in to provide greater variety in programming. Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill. PVP—March.

CHEMICAL INTERMEDIATE

For Resins, Oils, Plasticizers

Tetrahydro phthalic anhydride is a white powder chemical, which may be made reactive under certain conditions to produce plasticizers, alkyds, oils, wetting agents, etc. Melting point 102–104° C. Jasons Drug Co., 1085 Myrtle Ave., Brooklyn 6, N. Y. PVP—March.

PLASTICIZER

Flame-Resistant

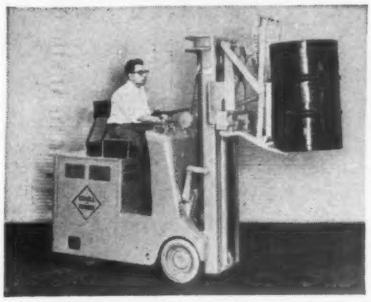
"Flexol" plasticizer (tri-2-chloroethyl phosphate) and marketed as Cetamole QU is intended for use with cellulose acetate and mixed cellulose esters, but may be used with nitrocellulose, ethyl cellulose, acrylics and synthetic rubber. According to the manufacturer, concentrations of 10% of this plasticizer will produce self-extinguishing compounds when it is used alone in cellulose acetate films. Soluble in mineral oil and miscible with common laquer solvents. Carbide and Carbon Chemicals Corp; Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y. PVP—March.

ANTI-STATIC DEVICE

Grounds Personnel

Designed for use on personnel working in combustible atmospheres, this anti-static grounding device is used to supplement the protection of conductive floor in paint plants and similar places. The device consists of a retractable contact-pin located on the shoe-sole. This assures positive electric contact between body and floor, and thereby removing static charges. It provides an unbroken conductive path, via the body, between ungrounded static storage points in the area and the floor itself. Walter G. Legge Co., 101 Park Avenue, New York, N. Y. PVP—March.

NEW PRODUCTS



Elwell-Parker

POWER TRUCK DEVICE

Speeds Handling of Drums

Faster action in lifting, transporting and stacking various forms of drums and drum products is accomplished by means of a power truck device just put into practice. This is of particular interest to manufacturers and distributors of steel drums and to users handling large quantities of oils, paints and other liquids and chemicals.

The device is supplied as ancillary equipment on the company's latest type, medium-weight, center-control truck, illustrated, or as an attachment interchangeable with the fork on other of its standard fork trucks.

It comprises a steel frame with base attached to elevating mechanism in the truck's upright column. In general dimensions it is not wider than a standard size 55-gallon oil drum. The single unit's handling capacity is 1000 pounds. Elwell-Parker Electric Co., Cleveland, Ohio. PVP—March.

ELECTRIC-MOTOR PUMP

Used with 55-Gal. Drum

Fully-automatic electric-motor pump may be used with 55-gallon barrels or 400-lb drums to pump heavy, viscous fluids lubricants. It may be substituted for compressed air in central tube system. The unit consists of 1 h.p. motor and is gear driven. A flanged drum-cover fits over the top of the center-opening or full-open drums. Lincoln Engineering Co., 5780 Natural Bridge Ave., St. Louis 20, Mo. PVP—March.

MALEO-PIMARIC ACID

Naval Stores Product

Maleo-pimaric acid, a new naval stores product developed by the Department of Agriculture, has possibilities for use in the preparation of plasticizers, resins, and emulsifying agents. The development has reached a stage where commercial testing is feasible and where samples for tests are available on request to prospective users.

Maleo-pimaric acid is the addition product of maleic anhydride with the 1-pimaric acid of pine gum. It is a white, crystalline, tribasic product with an acid number in acetone solution of 420 and a molecular weight of 400. The pure product (produced in small quantities in the laboratory) melts at 229° to 230° C. while maleopimaric acid produced in the pilot plant has a slightly lower melting point (222° to 225° C.). Maleo-pimaric acid is soluble in acetone, ether, alcohol, and aromatic solvents, and is practically insoluble in aliphatic hydrocarbons.

The properties of the maleo-pimaric acid are such that it should find successful application in alkyd-type resins and in sizing agents.

The low volatility of its alkyl esters and their compatibility with many resins indicates promise as a plasticizing agent.

The soap of the ethyl maleo-pimaric acid has been evaluated on a pilot-plant scale as an emulsifier in the preparation of a synthetic rubber.

Concerns or individuals interested in testing this product for possible commercial application may obtain samples by writing to the Naval Stores Research Division, Southern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, 2100 Robert E. Lee Blvd., New Orleans, 19, La. PVP—March.

TURBIDITY DETECTOR

Extremely Sensitive

This unit detects the presence of suspended solids in transparent liquids and is not affected by color of solution, aging, or drift of phototube, or voltage variations. The detection is based on ratio of scattered light to direct light falling on a single phototube.

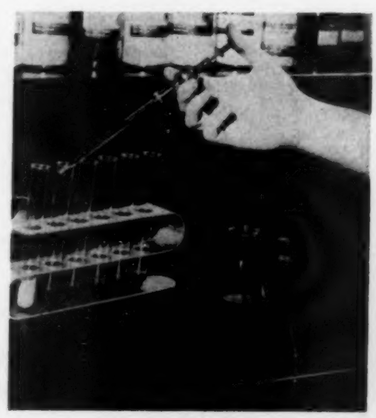
It is very sensitive and may be adjusted to a function of 5 p.p.m. of bleaching earth suspended in oil, at 0.5 p.p.m. nickel catalyst in hydrogenated fat. This unit may actuate a warning device and may initiate any on-off operation that can be handled by a relay. Sold under the trade name "Purfel" detector, this unit is manufactured by Electric Eye Equipment Co., Danville, Ill. PVP—March.

AUTOMATIC PIPETTE

For Volume up to 2 Ml.

Liquids used routinely in small quantities can be dispensed safely, accurately and conveniently by means of either of two new pipettes. The new automatic pipette will dispense any volume up to 2.0 ml. merely by operating a plunger. Once the volume selector has been set an adept operator can operate the pipette 20 to 30 times per minute. It has four slots and a vernier control whereby the stroke of the plunger is set to deliver an exact volume. The plunger is operated by means of a rubber bulb, and its stroke (therefore the volume) is uniform each time it operates.

The second new dispenser is a "Micropette" for volumes up to 0.7 ml. It has a unique sliding sleeve and setscrew arrangement by means of which any pre-set volume can be expelled. There is always an additional amount of fluid in the pipette, and only the desired amount is dispensed so that drainage errors are eliminated. With the Micropette and distilled water it has been found that the accuracy of liquid dispensed is within plus or minus 0.001%. Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Penna. PVP—March.



Fisher Scientfic

NEWS DIGEST

Am. Cyanamid's Coating Resins Department Holds Conference

A three-way conference of sales, research and production representatives of the coating resins department of American Cyanamid Company was held in Pittsburgh, Pennsylvania, from January 30th through February 1st, 1950. In addition to the New York office, the Bridgeville, Pennsylvania plant, and the Stamford, Connecticut laboratories, each of the district sales offices throughout the United States was represented.

After the conference was opened by Mr. J. L. Rodgers, Jr., general manager of the plastics and resins division, Mr. W. F. Whitescarver, manager of the coating resins department of that division, presided. The first two days of the conference, held at the Roosevelt Hotel, were devoted to an exchange of technical and market data, and discussions of present and proposed activities of the company in the coating resins field. These sessions ended in a social get-together and banquet on Tuesday evening. The following day, the entire group was taken on a tour through the company's Bridgeville, Pennsylvania plant.

Donald R. Wagner

Wagner Promoted Supervisor of Pol-mer-ik Linseed Oil Sales

Donald R. Wagner has been promoted to supervisor of Pol-mer-ik Linseed Oil sales, eastern division of Archer-Daniels-Midland Company, J. W. Moore, vice-president, announced.

He is now directing Pol-mer-ik Linseed Oil sales in metropolitan New York, New Jersey, and New England areas from the New York office. Before joining the ADM Pol-mer-ik sales department 18 months ago, Wagner was employed by the Dayton Company and Juster Brothers, Inc., both Minneapolis retail firms. He was assistant publicity director of the Minneapolis Acquatennial in 1948.

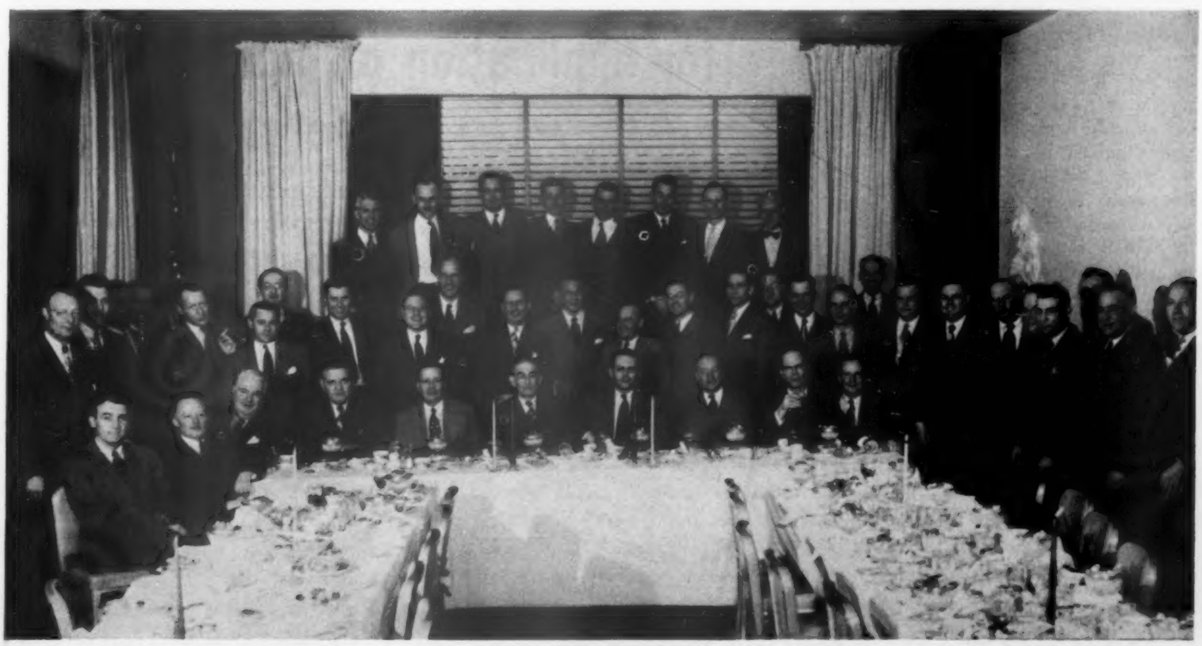
Cabot Carbon to Offer U. K. Both American and British Carbon Blacks

Godfrey L. Cabot, Inc., Boston, raw materials manufacturers, announce that, effective April 1, 1950, the marketing of their products throughout the United Kingdom will be conducted by Cabot Carbon Limited, Dashwood House, Old Broad Street, London, E. C. 2, England. Formerly the firm of Hughes & Hughes, Limited, London, England dealt in these products, the marketing of which they will discontinue on April 1, 1950.

The General Atlas Carbon Co., a subsidiary of Godfrey L. Cabot, Inc., will similarly market its well known brands, Gastex and Pelletex, through Cabot Carbon Limited, inasmuch as R. W. Greeff & Co., Ltd., London, have relinquished the sales of these brands, effective April 1, 1950. General Atlas products will be sold elsewhere by the regular, established agents of Godfrey L. Cabot, Inc.

Cabot Carbon Limited will sell, in addition to the American produced carbon blacks and other products of Godfrey L. Cabot, Inc., the carbon black output of its Ellesmere Port plant, now in construction. The Cabot Carbon Limited plant, incidentally, is the first of its kind to be built in England under the E.C.A. planning program.

The net result of these changes is that Cabot Carbon Limited will now be in a position to offer to the British trade a complete line of both American and British produced carbon blacks.



American Cyanamid Conference

NEWS DIGEST

Meyer Budman

Charles Ross & Son Co. Names Budman Special Representative

Charles Ross & Son Company, 148 Classon Avenue, Brooklyn, New York, manufacturers of Paint Mixing and Grinding Machinery, have appointed Mr. Meyer Budman of Superior Materials, Inc., 120 Liberty Street, New York, N. Y., as special sales representative in the Metropolitan area, including New Jersey and other near eastern cities.

Mr. Budman has a thorough background and knowledge of the processing of paint and the machinery used therefor. He is a graduate of the College of the City of New York and a member of Phi Beta Kappa. Mr. Budman has had several years of experience in a technical capacity formulating, making and testing paints and allied materials. For the past four years, Mr. Budman has been active in the sale of raw materials to the paint, varnish, lacquer, printing ink, adhesive and allied industries, and he will also continue in this activity.

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A.S.T.M. Paint Group Discusses Colorimetry

At the main meeting of American Society for Testing Materials' Committee D-1 on paint, varnish, lacquer, and related products, in Pittsburgh, Pa., held on March 1, at Hotel William Penn, there was a panel discussion on colorimetry.

The moderator of the session was Walter C. Granville, assistant director, department of design, and head of the color standards department, Container Corporation of America, Chicago, Ill.

G-E Appoints John Lux Mgr. of Development Lab.

Dr. John H. Lux has been appointed manager of the New Product Development Laboratory of the General Electric Company chemical department according to an announcement by Dr. C. E. Reed, engineering manager.

In 1941 Mr. Lux became a research and development engineer for the Carbide and Carbon Chemicals Corporation at South Charleston, West Virginia. During the war he served as assistant director of research and development for the Neville Company in Pittsburgh, Pa. Later, he spent several years in his own consulting practice and in 1947 he became director of the specialties division for Witco Chemical Co. In 1948 he was made director of research for Witco.

Central Scientific to Distribute G-E Silicones for Laboratory Use

The Central Scientific Company of Chicago has been appointed distributor of General Electric silicone products for use in laboratories. These products, members of a new chemical family developed during the last World War, include G-E Dri-Film water repellent and blood anticoagulant, silicone oil, and silicone stopcock lubricants.

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National Lead Appoints Orling

Eric G. Orling has been appointed manager, pigment sales, for the Cleveland Branch of National Lead Company. R. B. Gilbert continues as trade sales manager and Thomas B. Williams as assistant trade sales manager.

Raymond B. Hall

Metals Disintegrating Names Sales Representatives

Metals Disintegrating Co., Inc., Elizabeth, N. J. manufacturers of metal pigments, metal powders and metal abrasives, has announced the following appointments:

Raymond B. Hall has been named sales representative in New England. He will handle the sales of metal pigments, aluminum paste and powder and gold bronze powders.

Eugene Lenrow has been named sales representative in New York State, and will handle the sale of metal pigments and allied products in all counties except Niagara, Erie and Chatauqua. Mr. Lenrow's experience covers over ten years in the sale of chemicals, paints, varnishes and lacquer in the New York and New Jersey areas.

Eugene Lenrow

Voltax Appoints Layman

Mr. Ralph E. Layman has recently been appointed technical director of The Voltax Company, Inc., of Bridgeport, Conn., manufacturers of organic coatings for industry.

Mr. Layman was graduated from Lehigh University, receiving his B.S. degree in Chemical Engineering in 1935. He immediately joined the American Cyanamid Company of Bridgeville, Penn. and Stamford, Conn. as resins chemist. In 1939 he helped establish the Insulation Products Corporation at Willimantic, Conn., becoming general manager and chief chemist. After several years of private consulting practice, Mr. Layman joined the technical staff of The Voltax Company, Inc.

Harold T. Illing Co. to Distribute Linseed Oils for Falk & Company

Of particular interest to manufacturers of paints, varnishes and other protective finishes in Wisconsin, upper Michigan, Eastern Minnesota, Iowa and Northern Illinois, is the recent news from Falk & Company that the Harold T. Illing Co., of Wisconsin, has been appointed to distribute Falkolin linseed oils in those areas.

According to Stanley D. Rogaliner, Sales Manager of Falk & Company, the Harold T. Illing Company will distribute the complete line of Falkolin linseed oils, including raw, boiled, refined, heat polymerized and blown linseed oils.

Carlton Rose Joins National Lead's Washington Office

Carlton H. Rose has joined the staff of the National Lead Company office in Washington, D. C. In addition, he will carry on from Washington his duties as head of the Company's specifications department, involving specifications for various products, test methods and other standards.

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Ralph C. Persons Elected Vice Pres. of Sun Chemical

At a meeting of the Board of Directors of Sun Chemical Corporation, Mr. Ralph C. Persons was elected a director and vice-president of the Corporation.

Mr. Persons, who has been with the Corporation since May, 1944, has served as sales manager of Geo. H. Morrill Co. Division, and general manager of Eagle Printing Ink Company Division. In July, 1946, Mr. Persons became general manager of the Geo. H. Morrill Co. Division. He will continue in this capacity and also be in charge of Sun's Graphic Arts Group, which is comprised of American Printing Ink Company, Eagle Printing Ink Company, Fuchs & Lang Manufacturing Company, Fuchs and Lang de Mexico, S.A. de C.V., General Printing Ink Company (East), General Printing Ink Corporation of Canada Limited, E. J. Kelly Company, Geo. H. Morrill Co., and Sigmund Ullman Company.

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Three G-E Engineers Honored for Work on Organo-silicones

Three members of the Chemical Department of the General Electric Company were recently presented the joint Coffin award—the Company's highest honor to employees. At a ceremony held at Waterford, N.Y., Austin W. Boyd, Jerome T. Coe, and James R. Donnalley, Jr., were honored for their joint achievement in the engineering development, design, construction, and testing of an improved reactor for the production of silicone chemicals at improved chemical efficiency and lower material and labor costs. The resulting unit has enabled the economical production of silicones in large volume by the direct process.

This achievement represents a major step forward in the company's efforts to pioneer and to lead in this uncharted field of organo-silicon chemistry.

Donald S. Mason

Schenectady Varnish Appoints Mason Tech. Representative

Donald S. Mason has been appointed technical representative of all divisions of the Schenectady Varnish Company, Schenectady, N. Y., in New York State, exclusive of greater New York City, it was announced by John B. Emans, vice president and sales manager. Mr. Mason is a graduate of Syracuse University and served in the U. S. Army for three years during the recent war.

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Shellac Industry Launches Advertising Campaign

The first industry-wide national advertising campaign and retail sales promotion program to be launched in the shellac field will be inaugurated this coming spring.

The national advertising, which will make its first appearance in April issues of consumer magazines, will feature primarily the merits of shellac as a floor finish, and in addition will point out that shellac has been "the finest furniture finish for centuries." Beginning March, large-space advertisements will appear in a selected group of trade publications reaching the retailers of shellac and home building contractors.

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National Lead Names Anker New Head of Norway Plant

National Lead Company has announced the appointment of Erik Anker as managing director of Titan Company A/S of Fredrikstad, Norway. Mr. Anker succeeds Dr. Gustav Jebsen, who retired on February 1. Dr. Jebsen has been managing director of Titan Company A/S since 1922. Mr. Anker was export manager of the Norwegian Aluminum Company from 1935 until 1937, when he became sales manager of Titan Company A/S.

Paint & Varnish Exchange Club To Hold Next Meeting April 18th

The Paint & Varnish Exchange Club, Inc., will hold its next meeting on Tuesday, April 18, 1950 in the Taft Room of the Taft Hotel, 50th Street and 7th Avenue, New York City. Dinner is optional in the Tap Room of the Taft Hotel, at 6 P. M. The meeting will start promptly at 7:30 P. M. in the Taft Room.

The guest speaker will be Mr. Kenneth V. McCullough, Group Leader—Head of Protective Coatings Development Department of the Bakelite Corporation, Bloomfield, New Jersey, which is a unit of Union Carbide and Carbon Corporation. Mr. McCullough's subject will be "Coating Resins Based on Styrenes." The member speaker will be Mr. William N. McKee, Technical Sales Manager of the W. A. Cleary Corporation, New Brunswick, New Jersey. Mr. McKee's topic will be "Soya Lecithin." Guests are cordially invited to attend this meeting.

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Packaging Exposition

The American Management Association announced that its 19th National Packaging Exposition, annual market place for packaging, packing and shipping materials, machinery, services and design, will be held April 24-27 at the Navy Pier in Chicago. J. M. Cowan, chairman of the Exhibitors' Advisory Committee and assistant director of distribution of the Dobeckmun Company, Cleveland, estimated attendance of the 1950 Exposition will exceed 14,000.

At the same time Mr. Cowan made public results of an analysis of the attendance of this year's Exposition in Atlantic City. Representatives of over 5,000 firms in 400 industries explored the products and services offered by 200 exhibitors in this $6 billion-a-year packaging, packing and shipping industry.

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McClure Receives CCDA Award

Harry B. McClure was the recipient of the first Commercial Chemical Development Association Honor Award, it was announced recently by C. D. Goodale, president of the Commercial Chemical Development Association and chairman of this year's award committee. Mr. McClure received the award scroll at a banquet highlighting the annual meeting of the Commercial Chemical Development Association to be held at the Roosevelt Hotel in New York City on March 22, and the subject of Mr. McClure's address on this occasion was "Recent Case Studies in Chemical Development."

TECHNICAL Bulletins

SOLVENTS CHART

A very comprehensive chart covering solvents, diluents and plasticizers used in lacquer formulations has recently been published by the Shell Chemical Corp., 500 Fifth Ave., New York 18, N. Y. and 100 Bush St., San Francisco 6, Calif. A complete tabulation of such important data as chemical formula, molecular weight, specific gravity, boiling point, vapor pressure, flash point, solubility, dilution ratio, etc. are presented. Dilution ratio and viscosity graphs are also given.

WET GROUND MICA

This bulletin, based on research, supervised by Dr. Max Kronstein at New York University, is concerned with methods of combining wet ground mica in paint formulations. Some literature on the subject claims that mica is most effective when mechanically stirred into an already-milled paint paste. In actual practice, however, mica is often milled in with the other pigment substances.

The work on this project has established that at least in the case of coatings which are required to have good moisture resistance, the regular milling process is far more successful than that of stirring in mechanically and can be recommended. Test procedure, results and recommendations are also included. Write to Wet Ground Mica Association, Inc., 420 Lexington Ave., New York 17, N. Y.

POLYVINYL ACETATE

The properties and uses of polyvinyl acetate and its method of manufacture by the solution polymerization of vinyl acetate at high concentrations in a variety of solvents are covered in this 32-page bulletin published by the American Polymer Corp., 101 Foster St., Peabody, Mass. Compounding, uses, storage and handling of polyvinyl acetate emulsions are also covered.

GLYCERINE BOOKLET

"Why Glycerine for Alkyd Resins and Ester Gums?", a booklet containing information regarding the uses of glycerine in this industry is available. It combines basic technical data of concern to the chemist with interesting facts about usage for the non-technical buyer.

Pointing out that the chemical structure of glycerine makes possible a wide variety of modifications of the basic resin, this 12-page work outlines the general reasons for glycerine's use, and in text, tables and charts gives further information as to its physical properties, origin, development, and chemistry. Included are tables of specific gravity, viscosity, freezing point, etc., of aqueous glycerine solutions at various concentrations, and a bibliography of references. This booklet has been prepared with the assistance of technical consultants, and the research laboratories of the glycerine Producers' Association. Copies can be had free on request to the Glycerine Information Service, 295 Madison Avenue, New York City 17.

FILM CHART

The National Adhesives Division of National Starch Products, Inc. has recently published a chart which presents comparative properties and uses of common transparent films. Cellophane, cellulosics, diafanes and the various vinyl films are covered.

Their characteristics in actual use are discussed as well as the physical and chemical properties, the name of the manufacturer, trade names, and description.

Supplementing this chart is a pocket-size booklet "How to Handle Adhesives for Transparent Films." This gives detailed information of formulating adhesives for bonding transparent films, handling methods, etc. These booklets may be had by writing to the National Adhesives, 270 Madison Avenue, New York City 16, N. Y.

WAX EMULSION

Wax and wax resin emulsion for application on paper and board surfaces are described in 4-page folder published by the Hercules Powder Co., Wilmington, Del. Improving sizing, printability and increasing slip are discussed in this folder.

ELECTRIC HEATERS

Both portable and suspension type, electric heaters are covered in this 8-page bulletin. These units are described as being safe, and economical to operate. Capacities and methods to estimate for proper size heater are also included. Obtain your copy from the Electromode Corp., 45 Crouch St., Rochester 3, N. Y.

TECHNICAL GUIDES

Two new technical guides for the paint industry have been issued by the Chemical Division of The Goodyear Tire & Rubber Company, Akron, Ohio.

Techni-Guide 517 deals with the use of Pliolite S-5 resin in exterior and concrete paints, giving formulation, preparation and properties in detail.

The other bulletin, C-102, deals with the successful introduction of Chemigum Latex 101, a synthetic latex, as a vehicle for interior wall finishes, making possible the use of water as a thinner.

PLASTICIZER BOOKLET

The Plastolein Department of Emery Industries announces its second edition of "Plastolein Products," which covers properties, characteristics, and application data for Emery's complete line of primary and secondary plasticizers, including Plastolein 9720 resinous type plasticizer. The booklet also contains sections on Palargonic Acid (low molecular weight fatty acid), special liquid fatty acids developed primarily for alkyd resins, and the new Emery M-461-R dimer acid (Di-Linoleic Acid). Specifications, characteristics, and applications of these products in the surface coatings field are thoroughly described, according to the manufacturer. Emery Industries, Inc., Plastolein Dept., 4206 Carew Tower, Cincinnati 2, Ohio.

FATTY ACID ESTERS

A 24-page catalog gives complete specification and application data on a sizeable number of polyhydric alcohol fatty acid esters. The esters are non-ionic surface active agents, emulsifiers and thickeners and have a wide range of uses in a diversified number of industries. Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.

PULVERIZING EQUIPMENT

A new 50 page book has just been issued by Pulverizing Machinery Company of 235 Chatham Road, Summit, New Jersey, manufacturers of pulverizing and dust collecting equipment.

The Micros displayed on its pages visualize as completely as possible the complete line of equipment and their wide use and applications in the production and handling of fine and ultra-fine powders of a great variety of materials, including chemicals, colors, dyestuffs, pigments, resins, plastics, ceramics, insecticides, fungicides, limes, minerals and metals.

Included in the new book is found a complete description of the various types of pulverizers for precise particle control on a wide range of applications A three-page list of materials to which the equipment is applicable supplements this section of the book.

Another part of the book is devoted to the atomizer, which is designed for ultra-fine grinds in the lower micron ranges. The collector, for the separation of solids from dust-laden air, is also pictured and described in some detail.

Featured in the front part of the book is the Mikro Plan for Processing Efficiency, in which is outlined the engineering, laboratory analysis, test grinding and after-installation service, which are a featured part of the company's program.

The proper equipment for laboratory and pilot plant pulverizing operations preparatory to production runs, is also shown and described in detail.

SYNTHETIC WAXES

Synthetic waxes for some uses are more suitable than natural waxes and in some cases are unique, producing effects not obtainable before. They are made to close specifications and do not vary in composition or contain foreign matter like the natural waxes.

A new 16 page catalog describing the newer synthetic waxes is now ready for distribution by the Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y. This contains tables giving solubility, specific gravity, melting point, color, flash point and acid value and use data.

METAL POWDER ANALYSIS

A new standard for the metal powder industry has just been released by the Metal Powder Association. Designated as M.P.A. Standard 7-49T, Tentative Methods for Determination of Iron Content of Iron Powder, the standard describes procedures for the chemical analysis of granular iron powder to determine: 1) Total iron content 2) Metallic iron content 3) Ferric and ferrous oxide content.

The methods described in M.P.A. Standard 7-49T provide simple and direct procedures for determining the total and metallic iron content of iron powder such as that used in powder metallurgical applications. The Metal Powder Association has issued methods of chemical analysis of metal powders as follows: 2-48T, Method for Determination of Hydrogen Loss of Metal Powders and 6-48T Method for Determination of Insoluble Matter in Iron and Copper Powder. Analytical methods for elements other than those included above and in the new Standard 7-49T are essentially the same as in wrought metal analysis. Copies of M.P.A. standards may be obtained for 25¢ per copy by writing to the Metal Powder Association, 420 Lexington Avenue, New York 17, New York.

VINYL BUTYRAL RESINS

This 22-page booklet contains properties, compatability and applications of Vinylite vinyl butyral resins. Considerable emphasis has been placed on the use of these resins as "a wash primer." According to the manufacturers, this type of metal conditioner provides corrosion-resistant film and also promotes adhesion of subsequent paint films. Bakelite Corp., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

CHEMICAL DEVELOPMENT

Bibliography listing 135 books, pamphlets, and articles dealing with chemical development was recently issued by the Chemical Dept. of General Mills Research Laboratory, Minneapolis, Minn. This is being offered to the chemical industry as a public service.

SILICONE DIELECTRIC

A technical report has been published on a General Electric silicone dielectric compound called G-E 81083. This smooth, homogeneous mixture is designed to provide a chemically stable, waterproof, dielectric sealing compound for aircraft ignition systems and electronic equipment. As a dielectric, it is also being used to waterproof exposed surfaces on plastics and ceramic insulators.

This compound forms a waterproof seal and is substantially unchanged by temperatures from -70F to 450F. It will wet and adhere to both metallic and non-metallic surfaces, but is non-corrosive and relatively inert chemically. It has good resistance to steam, hot water, and hot air. Write to The Chemical Dept., General Electric Co., Pittsfield, Mass. for your copy.

NEW PRODUCTS

New Product Bulletin No. 12, concerning the physical and chemical properties of four beta substituted propionitriles, of which three are new products, has been recently published by the New Products Development Department, American Cyanamid Company. The products concerned are B-dimethylaminopropionitrile, B-isopropylaminoproprionitrile, B-methoxypropionitrile, and B-isopropoxypropionitrile.

The alkylamino compounds are miscible with water, while the alkoxy compounds are soluble to a lesser degree. All four nitriles are soluble in the common organic solvents. The chemical reactivity of these nitriles has led to their potential application as intermediates for the synthesis of new plasticizers and resins.

Copies of this bulletin may be obtained by addressing the New Product Development Department, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, New York.

MIXING BROCHURE

Description and operating principles of the Brookfield Counter-Rotating Mixer are described in this bulletin. Uses, specifications, and prices are also included. Write to the Brookfield Engineering Laboratories, Inc. Porter St., Stoughton, Mass., for your copy.

CLUB NEWS

KANSAS CITY

The February Meeting of the Kansas City Paint and Varnish Production Club was called to order by President Koehn at 6: 45 PM, February 9th., at the Pickwick Hotel. There were 38 members and guests present.

President Koehn introduced Mr. A. T. Montanye, the National Federation President. Mr. Montanye gave a brief talk covering present Federation activities and plans for the coming year.

President Koehn then introduced Mr. G. M. Babcock, Technical Director: Pigment Division of the Reynolds Metals Company. Mr. Babcock presented the Reynold's technicolor film "The Tale of the Powdered Pig." This film covered the reduction process from bauxite to alumina to aluminum, then through the different manufacturing and milling processes such as stamp mills, ball mills, and the atomizing process for making atomized powders. The remainder of the film touched on the many uses of aluminum pastes and powders in plastics, automobile finishes, roof coatings, and tank and structural paints.

To demonstrate the enormous leafing and covering properties of aluminum powders, a scene in the film showed how a distress signal containing a small amount of aluminum powder and released on the water, covers a vast area and can be seen for miles by search planes.

After the showing of the film Mr. Babcock gave a short talk on "the importance of coarser grades of pigments," relative to the exterior durability, and bringing out the trend of the automobile stylists toward the coarser grades for polychromatic automobile finishes to give a richer look to the products in this field.

NEW YORK

The regular March meeting was held on March 2nd at the Building Trades Employers Association at 2 Park Ave., New York, N. Y., with 230 members and guests attending.

The guest speaker of the evening was Mr. Francis Scofield, of the Scientific Section of National Paint, Varnish and Lacquer Association. Mr. Scofield spoke on "Lights for Color Matching," and discussed and demonstrated the appearance of colors under various light sources. He pointed out that the color of an object depends on the light source, the nature of the sample, and human differences. Kelvin scale lamps were used to show the effect of various lights on sample colors.

NEW ENGLAND

Ninety-six members and guests attended the February meeting held at the Hotel Puritan on February 16th.

The guest speaker of the evening was F. E. Piech, of the Hercules Powder Co., who gave an interesting study on "The Evaluation of Equipment for Application of Hot Spray Coatings." His talk was illustrated by slides and covered the literature, equipment and laboratory data of hot lacquer application.

C-D-I-C

The 297th meeting of the C-D-I-C Club was held at Suttmillers' in Dayton, Ohio on February 13, 1950.

Under new business, Herb Fenburr reported that we will hold our regular June meeting in Columbus on the second Monday or Tuesday in June as in past years. The availability of Country Club will determine which day it will be (Monday or Tuesday) but it will be the second week in June.

Herb Fenburr then introduced the main speaker of the evening, Mr. Robert D. Ullrich of the Hercules Powder Company, who spoke on the subject "Lacquers for Use on Paper."

The talk was well illustrated with slides. Mr. Ullrich stated that lacquer coatings for paper have been predominately used in food packaging but that other usages such as coatings for wall paper, coatings for catalogues, advertising booklets, etc., are becoming more and more important.

He stated that cellulose coatings fall into four general classes—nitro cellulose, ethyl cellulose, cellulose acetate and parlon coatings. He discussed the various formulations used for special purposes such as gloss heatseal coatings, moisture proof coatings, wall paper coatings, gloss grease proof coatings for menus, etc.

At the close of the talk Mr. Ullrich distributed a booklet on "Packaging and Paper Lacquers based on Nitro Cellulose" and samples of various coatings were also given to the members of the Club. After the question and answer period the meeting was adjourned with a rising vote of thanks to the speaker.

NORTHWESTERN

The February meeting was called to order by President Skotnicki with 56 members and guests present at the Town & Country Club.

President Skotnicki reported on a meeting of the Technical Committees of January 6 at which the 1950 Technical Committee consisting of W. A. Jordan, Chairman, An Hwa Liu, J. Rouse, and S. A. Thompson planned work on a paper dealing with the mono, di, and triglycerol esters of linseed acids.

A new 1952 Technical Committee Chairman, J. B. Kenney, was appointed.

There being no other business, Mr. Carlson introduced Dr. Clovis Adams of the Sherwin Williams Company who talked on the subject, "Cofumed Leaded Zinc Oxides in House Paints." Dr. Adams' slide-illustrated talk consisted of two parts: 1) Review of advances in paint technology over the last twenty years; 2) Cofumed leaded zinc oxides in house paints.

Dr. Adams told of large numbers of exposure panel tests which tended to prove the following enumerated conclusions: 1) Cofumed leaded zinc oxides show less checking and cracking than mechanical mixtures. 2) Large particle and acicular leaded zinc oxides show less checking, cracking and mildewing than the finer particle types; 3) Cofumed types show less mildewing, 4) Less oil penetration is noted with the cofumed type; 5) Absence of lead pigment causes more oil penetration; 6) Cofumed types have a lower reactivity rate with oil acids; 7) Cofumed types have best general weathering properties.

CHICAGO

On February sixth, 120 members of the Chicago Paint & Varnish Production Club gathered at the Furniture Club of America for the regular monthly dinner and business meeting. Mr. A. T. Montanye, National Federation President was an honored guest of the Club. He spoke briefly on the manifold activities of the Federation and the service which it renders to the paint industry. Plans were formulated for a continuation of the Chicago Paint Industry scholarship and fume control projects. Fundamental courses in paint technology will receive full credit according to Dean Kintner of Illinois Institute of Technology, who was present. Dr. Selheimer and the holder of the fume control fellowship gave a resume of the basic work which they have done on this project.

Mr. R. D. Ullrich, Cellulose Products Division, Hercules Powder Company, presented a paper on "Lacquers for Use on Paper." Principles of lacquer design based on an extensive research study were clearly shown. Modifications of base formulations with resins and plasticizers to meet specific problems were illustrated with actual samples of the end products. Outstanding gloss, color retention and grease-proofness are prominent among the many valuable features cited by the speaker as responsible for the marked success of lacquers in the field of paper coating.

ST. LOUIS

The February meeting held on the 14th attracted forty members and guests.

A. T. Montayne, president of the Federation was present, and he gave a very comprehensive report on the work of the Federation, reviewing its accomplishments and outlining some of its future work.

Mr. Warren W. Burr of the Research Laboratories of the Goodyear Tire & Rubber Company was guest speaker. Mr. Burr discussed the latest developments in emulsion paints, describing the company's Chemigum Latex 101 as a binder or vehicle in water-thinned flat and semi-gloss wall finishes.

ADVERTISER'S INDEX